



**DIRTART**

WORLD LEADERS IN TRAILS

## TRAIL MASTER PLAN

Mount Canobolas, Orange NSW

CLIENT: Orange City Council

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## 1 Document Overview

Version	Date	Author	Notes
Draft 1	25 June 2021	Jason Lam	Draft for comment / feedback
Draft 2	8 July 2021	Jason Lam	Summary / Executive Summary
Final Issue	26 August 2021	Simon French Jason Lam	Final amendments / additional information added from feedback from TEF & Council

## 2 Executive Summary

The Mount Canobolas Mountain Bike Project has been underway for the past several years. The project seeks to establish the town of Orange as a mountain bike destination of state significance. This stage of the project involves the trail network design, and assessment of proposed trail corridors for natural and cultural values.

A total of 104.4km of mountain bike trails have been proposed in the study area with the majority of the trails, 71.1km (68%), within the Mount Canobolas State Conservation Area (SCA), 27km (26%) in Glenwood State Forest, and the remaining 6.3km (6%) in Cabonne Shire Council land.

The concept design has been developed in conjunction with the detailed constraints mapping and analysis undertaken by *The Environmental Factor* and *Apex Archaeology*. All high sensitivity areas and designated 'no go areas' have been avoided through a vigorous process of desktop analysis, an extensive ground-truthing exercise, and an iterative process of interrogating the concept alignments with additional field data or new-found information. The resulting trail network presents a sustainable and highly sympathetic proposal that takes into consideration the many and varied ecological and cultural heritage constraints identified in the study area.

The majority of the trails have been proposed in the SCA due to the elevational opportunity available with Mount Canobolas presenting the natural high point from which riders of all abilities can enjoy a range of extended descending experience through the scenic landscape. The gravity focused network utilises a network of existing roads and service tracks to form the two main shuttle routes to transport riders between the two base trailheads and the summit drop-off. No additional car parking or hard infrastructure is proposed at the summit of Mount Canobolas due to the known ecological and cultural heritage values in this area. Rather, the facility design seeks to utilise areas of lower sensitivity at the base of the mountain where existing amenities such as toilet or car parking already exist. The proposed Tea House and Glenwood State Forest trailheads will be the primary entry points to the trail network and respective locations whereby visitors will park their vehicles to go riding.

DIFFICULTY (IMBA TDRS)	Green Circle (Beginner)	Blue Square (Intermediate)	Black Diamond (Advanced)	Double Black Diamond (Expert)
LENGTH (KM)	33.3	40.7	22.7	7.8
% OF TRAILS	32%	39%	22%	7%

Table 1 - Trail Difficulty Summary

STYLE	Cross-Country	Link / Climb	All-Mountain	Gravity
LENGTH (KM)	19.7	2.0	19.8	63.0
% OF TRAILS	21%	2%	21%	66%

Table 2 - Trail Style Summary

## 3 Introduction

### 3.1 Project Overview

*Dirt Art* has been engaged by *The Environmental Factor* (TEF) to develop a concept design for the Mount Canobolas Mountain Bike Project that avoids the ecological and cultural heritage constraints identified throughout the project study area. As part of the scope of works, *Dirt Art* were responsible for reviewing the original concept design put forward by *World Trail* in March 2016, selecting relevant elements of the concept to develop further and redefining those that were deemed as outdated within the current mountain bike market. The process has been entirely driven by the detailed constraints mapping undertaken by TEF's team of specialists working in conjunction archaeological and cultural heritage consultancy, *Apex Archaeology*.

The plan has a strong tourism and economic development focus, with the view to utilising mountain biking as a major component of the economic revival of the region. The project has genuine potential to shine the spotlight on the Mount Canobolas State Conservation Area (SCA), which was devastated in 2018 by intense bushfires. Large portions of the SCA remain badly affected by the bushfires with the post-fire trauma evident in the heavy weed infestations, walking tracks that are in need of repair/upgrade, and the presence of feral pigs. The development of the Mount Canobolas as a genuine world-class mountain destination will have the positive impact of generating funding to address the environmental issues that pre-exist within the SCA. The two go hand-in-hand, as the trails delve into areas that are heavily affected by the above-mentioned issues, there is an even greater impetus to resolve the problems as it will inevitably bring these matters to the forefront. In order for the trails to be a success, the SCA needs to undergo significant work to eradicate the weed infestations, upgrade the existing walking tracks to a suitable standard, and manage the influx of feral animals.

### 3.2 Key Objectives

The key objective of this project is to develop a mountain bike concept plan that:

- Avoiding wet areas: trails will, where possible, be placed away from areas that are likely to require imported surfacing, graveling, bridges and/or platforms.
- Avoiding sensitive areas: The final design process will where possible avoid known sensitive vegetation, animal habitats and areas of archaeological significance.
- Maximising the ride experience: The final design process will maximise the ride experience and limit ongoing maintenance through the use of targeted average and maximum gradients, incorporation of key features and targeting high-quality environments.
- Incorporation of positive controls: The final design process will, where possible, incorporate positive controls such as viewpoints and iconic environments.
- Streamlining intersections and optimising trail junctions: *Dirt Art* believe that a successful trail network should be intuitive to navigate and should be navigable

without extensive signage (which is not to say that signage should not be installed). *Dirt Art* would work to optimally organise intersections to ensure that navigating the network is a seamless, intuitive experience. This initiative will greatly improve the riding experience, particularly for visiting riders.

### 3.3 International Mountain Bicycling Association (IMBA) Guidelines

#### 3.3.1 Overview

In 2004, the International Mountain Bicycling Association (IMBA) published a book called '*Trail Solutions: IMBA's Guide to Building Sweet Singletrack*'. The book has since become the premier resource for professional trail builders across the globe with detailed information specific to the design, construction, and management of mountain bike trails in a variety of environments. *Trail Solutions* is widely referred to as the industry standard in terms of the leading source of information regarding the fundamentals of creating sustainable trails.

As mountain biking trails do not adhere or conform to any specific Australian Standard or relevant building code, the guidelines set out in IMBA's *Trail Solutions* publication is predominately referenced as the basis to which all trail design, construction, and management are holistically held to account and this will be no different in the Mount Canobolas Trail Master Plan.

#### 3.3.2 Trail Difficulty Rating System (TDRS)

The IMBA Trail Difficulty Rating System (TDRS) is a method of defining the technical difficulty of mountain bike trails. It is largely adopted worldwide as the international standard by land managers and commercial bike park facilities. Like the grading system used in skiing (Green Circle, Blue Square, Black Diamond, Double Black Diamond), IMBA's system uses the same categories with the addition of White Circle, which represents the easiest option.

IMBA TDRS specifies nominal guidelines for a trail's width, surface, average gradient, maximum gradient, and the obstacles or technical trail features (TTF) that riders may encounter on the specific grade of trail. These guidelines are vital not only to the design of trails, but also with respect to their construction as they ensure trails are consistent to their intended grade and therefore safe for riders to use. Riding enthusiasts expect a certain level of difficulty when they see the respective trailhead sign and associated difficulty symbol. Regardless of what trail network they are riding, the TDRS forms the underlying basis from which riders make an initial assessment as to whether they are competent to undertake the trail at hand or better off finding a more suitable trail that is in line with their skill level.

The IMBA TDRS table is attached on the following page.






IMBA Trail Difficulty Rating System					
					
	EASIEST WHITE CIRCLE	EASY GREEN CIRCLE	MORE DIFFICULT BLUE SQUARE	VERY DIFFICULT BLACK DIAMOND	EXTREMELY DIFFICULT DBL. BLACK DIAMOND
TRAIL WIDTH	72" (1,800 mm) or more	36" (900 mm) or more	24" (600 mm) or more	12" (300 mm) or more	6" (150 mm) or more
TREAD SURFACE	Hardened or surfaced	Firm and stable	Mostly stable with some variability	Widely variable	Widely variable and unpredictable
AVERAGE TRAIL GRADE	Less than 5%	5% or less	10% or less	15% or less	20% or more
MAXIMUM TRAIL GRADE	Max 10%	Max 15%	Max 15% or greater	Max 15% or greater	Max 15% or greater
NATURAL OBSTACLES AND TECHNICAL TRAIL FEATURES (TTF)	None	Unavoidable obstacles 2" (50 mm) tall or less  Avoidable obstacles may be present  Unavoidable bridges 36" (900 mm) or wider	Unavoidable obstacles 8" (200 mm) tall or less  Avoidable obstacles may be present  Unavoidable bridges 24" (600 mm) or wider  TTF's 24" (600 mm) high or less, width of deck is greater than 1/2 the height	Unavoidable obstacles 15" (380 mm) tall or less  Avoidable obstacles may be present  May include loose rocks  Unavoidable bridges 24" (600 mm) or wider  TTF's 48" (1,200 mm) high or less, width of deck is less than 1/2 the height  Short sections may exceed criteria	Unavoidable obstacles 15" (380 mm) tall or less  Avoidable obstacles may be present  May include loose rocks  Unavoidable bridges 24" (600 mm) or narrower  TTF's 48" (1,200 mm) high or greater, width of deck is unpredictable  Many sections may exceed criteria

Figure 1 - IMBA Trail Difficulty Rating System

### 3.3.3 Trail Design

IMBA's guidelines are used by *Dirt Art* as the basis to which all trails are designed and constructed. The IMBA TDRS outlines the various specifications and attributes that each trail must adhere to both in terms of how a trail is designed, but also how it is eventually realized in construction. A safe and sustainable trail starts at its very inception; its trail alignment is fundamental to its overall success. As such, the intended difficulty of a trail is at the forefront of every trail designer's mind as it dictates the average gradient that is acceptable and informs decisions made throughout the process when navigating the given terrain and refining the location of the trail and its associated technical trail features. The

guidelines set forth in IMBA's *Trail Solutions* therefore prescribe not only how trails are constructed, but also how they are inevitably constructed.

The five principles identified by IMBA for designing sustainable trails are listed below:

1. The Half Rule – a trail's grade should not exceed half the grade of the hillside or sideslope that the trail traverses
2. The Ten Percent Average Guideline – an average grade of 10% or less is generally considered the most sustainable
3. Maximum Sustainable Grade – exceptions to the 10% average grade guideline are dependent on a combination of the following factors:
  - a. Half Rule
  - b. Soil Type
  - c. Rock
  - d. Annual Rainfall Amount
  - e. Grade Reversals
  - f. Type of Users
  - g. Number of Users
  - h. Difficulty Level
4. Grade Reversals – ensures the trail tread is broken up into smaller, controlled segments to divert water passively off the trail's surface by subtle changes in grade
5. Outslope – refers to a 5% crossfall across the trail tread to promote water to sheet passively off its surface to the downhill or outer edge

It is worthwhile noting that these design principles differ significantly from typical road and civil construction methodologies. This is for the most part due to the fact that the vehicular loads are dramatically different in terms of a passing bicycle versus a car. With the exception of boardwalks or bridges, the surface of mountain bike trails is completely reliant on being naturally surfaced with passive modes of drainage subsequently taking precedence over hard infrastructure such as pipes and culverts due to the generally remote wilderness setting. Trails do not have the luxury of diverting water into a stormwater catchment system, but rather, needs to be passively dispersed in a highly sensitive and non-damaging way into the natural environment.

### **3.4 Legislative Context / Considerations**

The Preliminary Environmental Impact Assessment (PEIA) that this Trail Master Plan adjoins details the legislative context and framework to which the proposed Mount Canobolas Mountain Bike Trails project sits within. As such, *Dirt Art* reaffirms the design proposal satisfies the key elements found within the following strategies and policies that are relevant to mountain biking and this project site:

- Mount Canobolas State Conservation Area Plan of Management (2019)
- OEH Cycling Policy (2011)
- OEH NSW NPWS Sustainable Mountain Bike Strategy (2011)

- OEH Sustainability Assessment Criteria for Visitor Use and Tourism in New South Wales National Parks (2011)

### 3.4.1 Mount Canobolas State Conservation Area Plan of Management (2019)

The Plan of Management (PoM) identifies the opportunity to “investigate the provision of sustainable single-track mountain biking opportunities and a hub or track head in the park” within the Mount Canobolas State Conservation Area (SCA).

Dirt Art confirms the following considerations have been undertaken during the design of the Trail Master Plan:

- Ecological sustainability
- Appropriateness of the location
- Competing visitor demands
- Visitor safety
- Opportunities on alternative sites
- Availability of resources to provide and maintain the experience
- ‘No go’ areas may be established in this investigation

Consideration	Consistent with proposal	Context of proposal
Ecological sustainability	Yes	Please refer to the PEIA.
Appropriateness of the location	Yes	The project study area and its respective land parcels were selected for its elevational opportunities and suitability in delivering gravity-focused descending trails in an accessible format conducive to an uplift user model.
Competing visitor demands	Yes	The uplift user model reduces the need for individuals to drive their personal vehicles to the summit area where there is limited car parking. Instead, the proposal distributes the competing visitor demands of the mountain bike trails to two trailheads at the mountain’s base where there are less site limitations. There is adequate space at these respective locations for shuttles vehicles to pick-up riders and transport

		them to the summit from where they can ride back down.
Visitor safety	Yes	Visitor safety is paramount to the proposal with a variety of trails of varying lengths and difficulties catered specifically to all spectrum of rider abilities and fitness levels. From Green Circle (Beginner) through to Double Black Diamond (Expert), the proposed trails follow the IMBA TDRS to ensure a level of consistency is achieved throughout the proposed trail network.
Opportunities on alternative sites	Yes	The extension of the proposed trails to the north-western corner of the Mount Canobolas SCA allows an active link to existing and proposed trails in Glenwood State Forest.
Availability of resources to provide and maintain the experience	Yes	The detailed design and construction of the proposed trail network would be put out to the market for tender. The successful trail building company would be responsible for an agreed maintenance period post-practical completion. Following this point, it would be up to the land managers to nominate or engage a suitably qualified person(s) to continue ongoing trail maintenance on the proposed network.
'No go' areas may be established in this investigation	Yes	Please refer to the PEIA.

## 3.5 Methodology

The project has engaged the following methodology as detailed below.

### 3.5.1 Concept Design Review

The first stage of the project began with a detailed review of the original *Mt Canobolas Mountain Bike Trail Concept Plan* developed by *World Trail* in March 2016. The relating concept plan assessment is detailed in a report by *Dirt Art* and is available for viewing in **Appendix 1**.

The previous concept provided a good platform for progressing through to the next (current) phase of the project. However, there were several key aspects of the plan that were identified as having significant room for improvement and re-thinking in order to meet the demands of the current mountain bike market.

These are summarised below:

- Strong objections by the community due to the misconception that the proposed concept design was the final, 'to be constructed' scheme, as opposed to a preliminary proposal for the purpose of opening public dialogue
- Serious concerns raised by the community on the lack of detail and consideration of ecological and Aboriginal cultural heritage sensitivities throughout the study area
- An outdated trail network with a focus on long cross-country trails instead of gravity-focused descending opportunities for a variety of different skill levels and abilities
- The proposed network lacked variety in terms of trail types, styles, and lengths
- Trail difficulty breakdown too heavily weighted towards the intermediate market with not enough in the advanced to expert categories to draw major visitation from the enthusiast market

### 3.5.2 Inception Meeting

On Tuesday 17 November 2020, *Dirt Art* attended an inception meeting with the project control group (PCG) covering the following topics:

- Confirming the scope of the project
- Identify key dates and milestones
- Work, health, and safety matters
- Approvals pathway / planning context
- Site access requirements and land manager permissions
- Communications protocol
- Data acquisition:
  - Previous survey data
  - GIS datasets
  - LidAR

- Aerial imagery
- Stakeholder information
- Previous community engagement records
- PCG meeting dates

### 3.5.3 Site / Background Analysis

*Dirt Art* completed a desktop review of the project study area using the available datasets available in GIS as well as satellite imagery to help familiarise ourselves with the site. The exercise focused on finding elevational opportunities throughout the SCA as well as the adjoining Forestry lands, while investigating existing roads and access tracks that may potentially allow shuttle access to easily service a gravity-focused network. A key focus was to assess existing infrastructure and amenities that could be canvassed or upgraded instead of having to rely solely on new developments.

Following the initial concept plan review, *Dirt Art* were able to draw upon aspects of the original proposal and utilise our own experience and knowledge to seek out trail opportunities that are more in line with the current market. With a comprehensive understanding of the site, topography, and array of existing roads / fire trails, the next stage of the project was entirely dependent on the constraints mapping developed by *The Environmental Factor* (TEF) and *Apex Archaeology*.

### 3.5.4 Constraints Mapping

At the time of the study, there was very little in the way of consolidated data for the Mount Canobolas area with limited sources of public information available. Thus, one of the most important aspects of this project has been the ecological and cultural heritage sensitivity mapping that TEF and Apex Archaeology have conducted for the study area. This information has been vital to the project and the basis for all trail designs to occur in a highly informed and targeted manner.

*Dirt Art* were provided with a highly detailed GIS dataset identifying all of the known areas of sensitivity in the study area with items or areas classified in an ascending scale of sensitivity as listed below:

1. Low Sensitivity
2. Medium Sensitivity
3. High Sensitivity
4. No Go Area

### 3.5.5 Design Considerations

In light of recent bushfires and the damaged witnessed throughout the study area, the risks posed to the proposed trails by natural events such as storms, bushfire, and flooding are elements that need to be considered in the design. With the advent of climate change and

its adverse effects becoming increasingly apparent, the severity and frequency of these natural phenomena will continue to rise. As such, these factors must be considered during the design, construction, and management of trails.

#### *3.5.5.1 Dangerous Trees*

Mountain bike trails are predominately constructed from natural materials found within the given landscape such as soil and rock to create a sustainable trail surface. As such the trails themselves cannot be protected by storm or bushfire damage, however, the removal of dangerous trees during construction can be a useful mitigation measure to reduce the likelihood of unstable trees from falling across the trail. Any dead trees within the trail corridor should be identified and assessed by a suitably qualified arborist during construction works as these can become a hazard to construction workers as well as future riders, especially in high winds.

#### *3.5.5.2 Avoiding Low-Lying / Flat Areas*

During the design process, there has been a conscious effort to locate trails away from major water bodies and minimise the extent and number of watercourse crossings. Where these crossings are unavoidable, trails in the direct vicinity have been grouped together to cross at a single point to limit the number of water crossings and associated infrastructure. Furthermore, trails have been designed to avoid low-lying areas such as the base of valleys or gullies to ensure the proposed trail tread does not become a water-carrying vessel in itself. Similarly, prolonged flat sections with inadequate side slope or natural fall have been avoided as these areas are again prone to retaining moisture or flooding, especially after significant rainfall events.

#### *3.5.5.3 Bridges / Platforms*

In exceptional circumstances where avoidance through trail alignment is not possible, elevated platform or bridges maybe required to cross existing watercourses. In these scenarios, the trail designer should make every effort to minimise the length or span of the respective crossing by investigating the best point to cross the watercourse or gully in the detailed design process. Imported materials will be required to fabricate an elevated trail tread from timber, steel, fiber-reinforced plastic (FRP), or in all reality, a mixture of the three depending on the circumstances. The land manager needs to weigh up and consider the pros and cons of each material in terms of their cost to install, replace, and maintain as well as their susceptibility to damage in the event of a bushfire. Even the most elaborate and expensive steel structure will be compromised by fire, depending on the ferocity and intensity of the flame. As such, there is no perfect solution, but rather a balance in terms of implementing a structural device that is fit for purpose and does not detract from the natural landscape.

### 3.5.6 Concept Trail Development

Using the detailed constraints map, *Dirt Art* began the process of developing various trail concepts to avoid all 'No Go Areas' completely and avoid or minimise trails in 'High Sensitivity' areas. Trails have avoided all 'High Sensitivity' areas with the only exception being the crossings of watercourses, which have been strictly limited and actively managed by having multiple trails crossing at a single point where feasible. Any 'Medium Sensitivity' points/nodes have also been avoided completely.

It is important to note that this process of elimination has been ongoing as additional sensitivities are identified by other interested parties or whilst conducting field investigations. The concept has subsequently undergone multiple iterations to ensure we continue to avoid all areas classified as 'No Go Areas' or 'High Sensitivity'. At certain stages of the design process, entire sections of the trail network had to be reworked, realigned or removed entirely to eliminate conflicts with the identified ecological and cultural heritage constraints.

Specifically, the concept design has undergone the following key iterations as a process of refinement and avoiding additional constraints:

1. Concept Plan A – 22 February 2021
2. Concept Plan B – 1 March 2021
3. Concept Plan C – 29 March 2021
4. Concept Plan D – 10 May 2021
5. Final Trail Concept Plan – 25 June 2021

*Dirt Art* has worked closely with *TEF* and *Apex Archaeology* both in terms of ongoing desktop analysis as well as infield investigations. This collaborative approach has maximised the project teams' efficiencies by being able to make real-time changes in the field to avoid any areas identified by the respective consultants. This fluid process has allowed *Dirt Art* to ensure any key areas of sensitivity are avoided and resultingly adds another layer of interrogation to an already detailed and refined process.

### 3.5.6.1 Concept Plan A

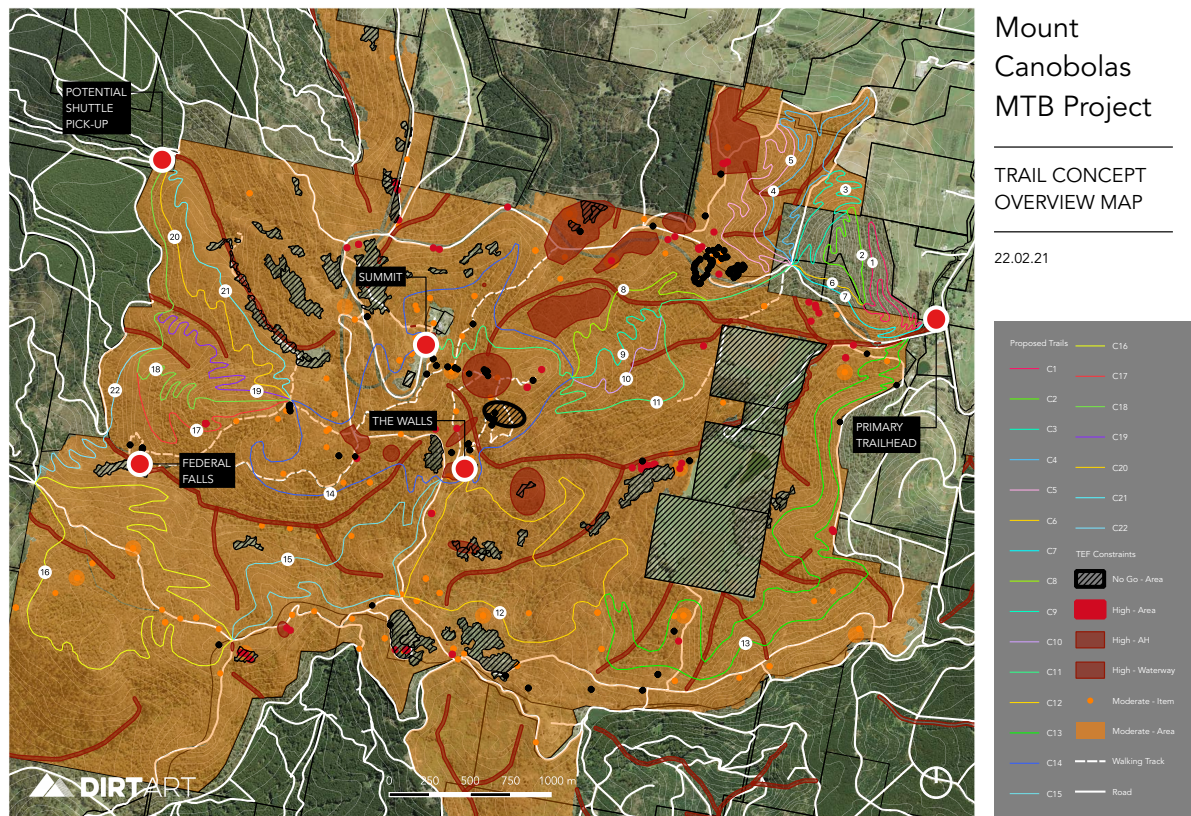


Figure 2 - Concept Plan A

#### Trail Concept Summary

The original concept plan that *Dirt Art* developed had a strong focus on the Mount Canobolas SCA with over 95% of the proposed trail concepts within National Parks' managed land and a small (5%) of cluster of trails in Crown / Council land in the north-eastern corner of the network surrounding Watts Pinnacle.

A total of four major trailheads were proposed:

- Primary Trailhead – Tea House
  - Sole entry point into the proposed trail network
  - Shuttle pick-up point
  - Car parking
  - Pedal access to cross-country network surrounding Watts Pinnacle
- Summit – Mount Canobolas
  - Shuttle Drop-Off Point
  - Access to the various gravity-focused trails
- The Walls
  - Minor trail hub to service backcountry loops to the south
- North-Western Border between SCA and Glenwood State Forest
  - Shuttle pick-up point

### 3.5.6.2 Concept Plan B

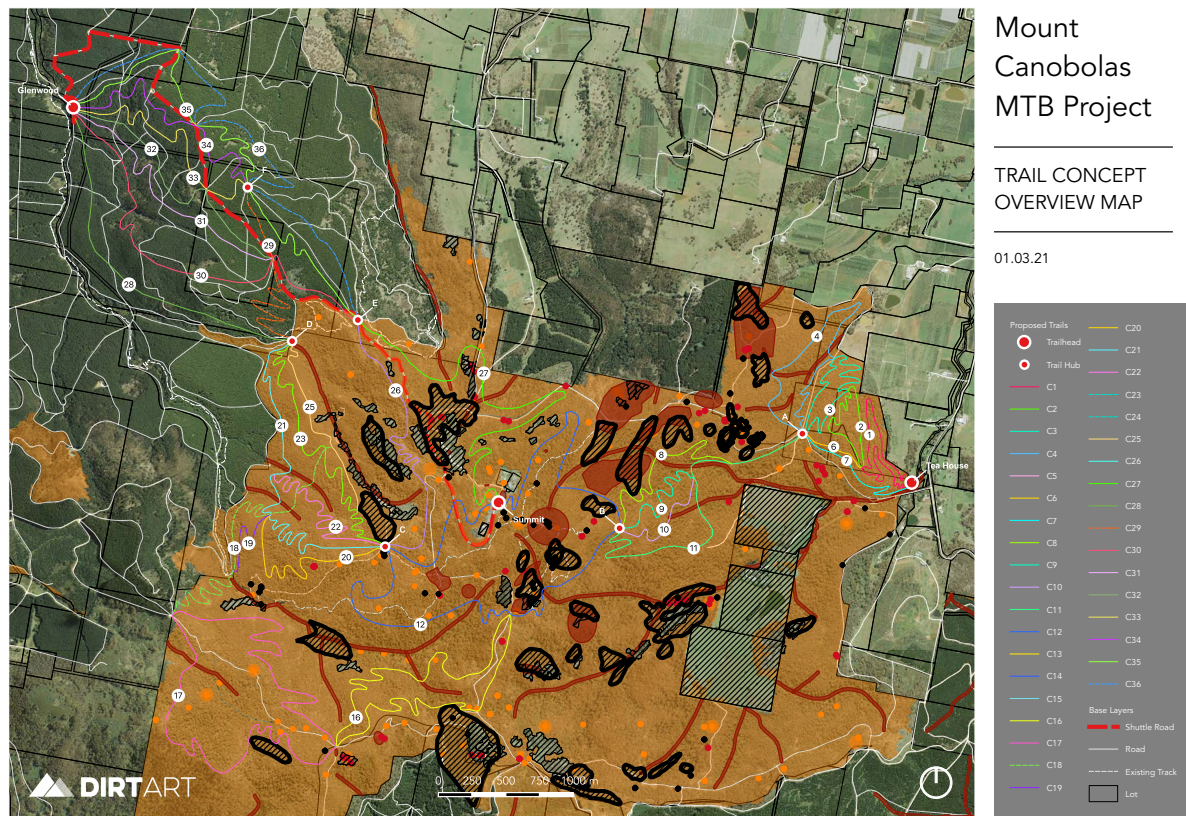


Figure 3 - Concept Plan B

#### Trail Concept Summary

With the addition of a series of 'No Go Areas' identified throughout the SCA, the proposed concept plan underwent a significant redesign. The trails proposed in the south-eastern corner of the SCA in Concept Plan A were completely removed as a result with some slight modifications to the cross-country trails to the north-west of Watts Pinnacle as well. Furthermore, the option of having an alternate descent from the summit to the east was deemed no longer viable given the constrained corridor and as a result a single trail was ultimately decided upon as the best way forward.

With such a large portion of the proposed trails removed from the network, *Dirt Art* investigated other opportunities within the study area to which the north-western ridgeline leading into Glenwood State Forest became a standout in terms of sustained elevational descent with good connectivity to an existing unsealed road (Mitchells Way) to the summit of Mount Canobolas. The consistent and gradual gradients in this area were identified as being well suited to bike park style trails with progressive freeride features such as jumps, drops, and larger berms. The area marked as having the best potential for trail development was also conveniently undergoing logging operations by Forestry Corporation NSW, which essentially maximises the lifespan of the proposed trails in this area before the next harvest cycle. With this in mind, the concept plan naturally began to evolve, proposing a series of trails funneling riders through a variety of freeride trails covering all trail difficulties towards a new trailhead in Glenwood State Forest to complement the existing Galinbundinya Trail.

### 3.5.6.3 Concept Plan C

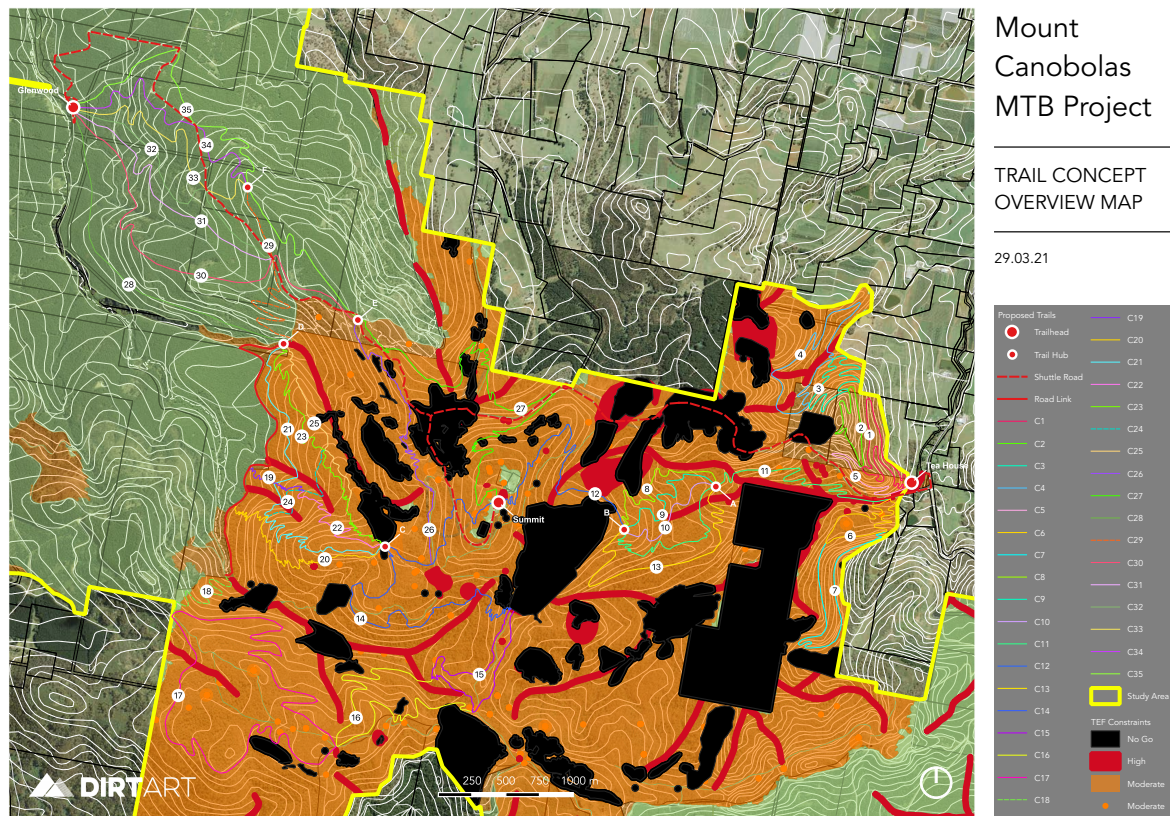


Figure 4 - Concept Plan C

#### Trail Concept Summary

In this iteration, additional constraints surrounding Young Man Canobolas were added, which led to the reconfiguration of the proposed Trail 14 as it was no longer viable as a trail circumnavigating the summit. The inclusion of another 'No Go Zone' at the junction between Mount Canobolas Road and Fern Tree Gully also resulted in the removal of a proposed trail hub as well as the significant redesign of several trails leading into this area.

At the time of this revision, *Dirt Art* trail design teams had commenced their field investigations with multiple teams operating across a myriad of trails undertaking ground-truthing exercises as well as marking the proposed trail concepts with flagging tape to allow the respective *TEF* and *Apex Archaeology* teams to follow behind. As such, some of the trail concepts shown in this revision begin to reflect the final trail corridors with minor realignments to avoid further ecological and cultural heritage sensitivities discovered during the fieldwork process.

### 3.5.6.4 Concept Plan D

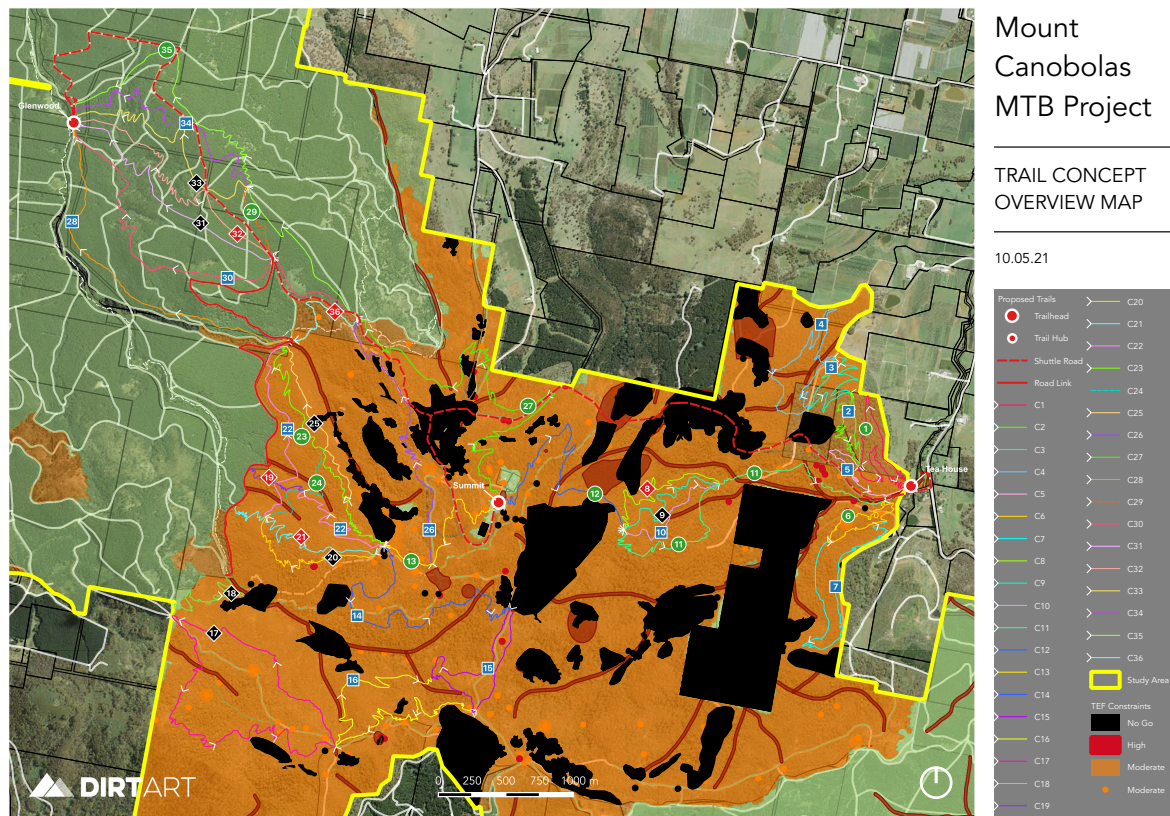


Figure 5 - Concept Plan D

#### Trail Concept Summary

This revision marks the completion of *Dirt Art's* field investigation with all proposed trail concepts ground-truthed and flagged. One additional trail, Trail 36, has been added to the proposal. This trail already exists and has been marked for minor upgrades in order to be included in the overall network put forward. Two additional Aboriginal cultural heritage sites were identified near the summit, which required Trails 13 and 27 to be rerouted respectively.

As per the request of the various project stakeholders, the proposed trail difficulty of the respective trails have been nominated in this overview map. This is an important step in educating stakeholders as to the reasoning behind having multiple descending trails in areas where one would seemingly suffice. The logic behind this clustering of trails is to ensure all riding abilities are reasonably catered for in each distinct riding zone. Similar to a ski slope analogy, there are multiple descending routes that range from beginner (Green Circle), intermediate (Blue Square), advanced (Black Diamond), and expert (Double Black) difficulty. This ensures all riding ability and skill levels are catered for throughout the proposed trail network. Where there are areas of high sensitivity or heavily constrained development corridors, for example the summit of Mount Canobolas, *Dirt Art* has proposed single descending trail options in the beginner (Green Circle) difficulty to maximise accessibility to the various trail zones.

### 3.5.7 Consultation

*Dirt Art* has participated in the consultation process led by TEF providing specialist trail knowledge and input throughout the process.

#### 3.5.7.1 Community

On Thursday 25 February 2021, *Dirt Art* attended the community consultation session held at Orange Civic Theatre by Orange City Council. The open forum was a chance for the project team to update the public about the status and progress of the Mount Canobolas Mountain Bike Project. Following a brief introduction from Council, *TEF*, *Apex Archaeology*, and *Dirt Art* all had a chance to each present a short update on our respective parts of the project before opening up to the floor to field questions from the audience.

There was considerable concern regarding the ecological sensitivities of the project study area, namely Mount Canobolas, as well as the potential impact mountain biking development would have on the site. Both *TEF* and *Dirt Art* fielded the majority of the questions with *TEF* clarifying that the strictest environmental assessments would be applied to this project and *Dirt Art* confirming that all trails would be designed to avoid all known 'No Go Areas' and areas of 'High Sensitivity' as provided in the detailed constraints mapping. Furthermore, questions were fielded with specific regard to the trails and their safety, sustainability, and overall impact on the surrounding environment. A significant portion of these questions were answered by providing detailed information regarding the design and construction methodology of professional trail building to IMBA standards.

#### 3.5.7.2 Stakeholders

There has been a total of three agency stakeholder meetings for the project.

- 15 December 2020 - Agency stakeholder meeting and tour of the mountain
- 2 February 2021 - Agency stakeholder working group meeting
- 28 April 2021 - Agency stakeholder working group meeting

### 3.5.8 Field Investigation

*Dirt Art* have undertaken extensive field investigations to ground-truth and flag all proposed trail concepts over the course of three separate trips between March-April 2021. Each trail concept proposed has been meticulously walked and flagged with high visibility survey tape to ensure the corridors are viable and there are no major issues that would adversely affect the constructability of mountain bike trails in these zones. During these investigations, our trail designers noted the prescribed construction methodology best suited to the terrain (machine vs hand build), proposed trail difficulty, and any requirements for infrastructure such as bridges or raised platforms for watercourse crossings.

### 3.5.8.1 Trip 1

Trip one occurred between 15-18<sup>th</sup> March 2021 with a large team from *Dirt Art* focusing primarily on the trails surrounding the summit. The team were joined by *TEF* as well as *Apex Archaeology* for the entirety of the trip. It was alarming for the project team to see the extent of the weed infestation problem within the SCA. The blackberry bushes were seemingly everywhere and made the fieldwork particularly difficult and slow. Fortunately, the western slopes of the mountain were less affected by the weeds, and progress quickened considerably as a result. This side of the hill definitely showed the world-class potential of Mount Canobolas as a mountain bike destination for the first time in terms of its rugged terrain and stunning natural features. Approximately half of the trails proposed in the SCA were covered in this original trip.

### 3.5.8.2 Trip 2

The second field trip occurred between 30<sup>th</sup> March and 1<sup>st</sup> April 2021 with the *Dirt Art* team joined by *Apex Archaeology*. The focus of this trip was on the more remote backcountry trails in the south-western corner of the SCA as well as the proposed network of cross-country trails near Watts Pinnacle on the opposite side of the SCA in the north-eastern corner. The majority of the trails remaining in the SCA were covered in this second trip with the exception of Trails 6 and 7.

### 3.5.8.3 Trip 3

The third and final field trip occurred between 26-28<sup>th</sup> April 2021 with the *Dirt Art* team joined again by *Apex Archaeology*. The focus of this trip was on covering the remainder trails in Glenwood State Forest as well as the two trails leftover in the SCA (Trails 6 and 7). Having been recently logged by Forestry Corporation NSW, the development area was clear of any major vegetation making the ground-truthing exercise much quicker and straight forward than previous trips.

## 4 Site Analysis

### 4.1 Location

Mount Canobolas is located in the Central Tablelands region of New South Wales, approximately 20km from Orange. With an elevation of 1,395m above sea level, the summit offers stunning 360-degree views from the city of Orange right through to the Blue Mountains. The project site extends from Mount Canobolas State Conservation Area (SCA) through to Glenwood State Forest to the north-west.

The Mount Canobolas SCA offers visitors scenic views with opportunities for birdwatching, walking, cycling, picnic areas, and camping. The nearby Glenwood State Forest is an active plantation managed by Forestry Corporation NSW.

The nearby city of Orange is known for its many established wineries as well as award-winning restaurants, which is a major drawcard for many Sydneysiders as a weekend getaway or escape.

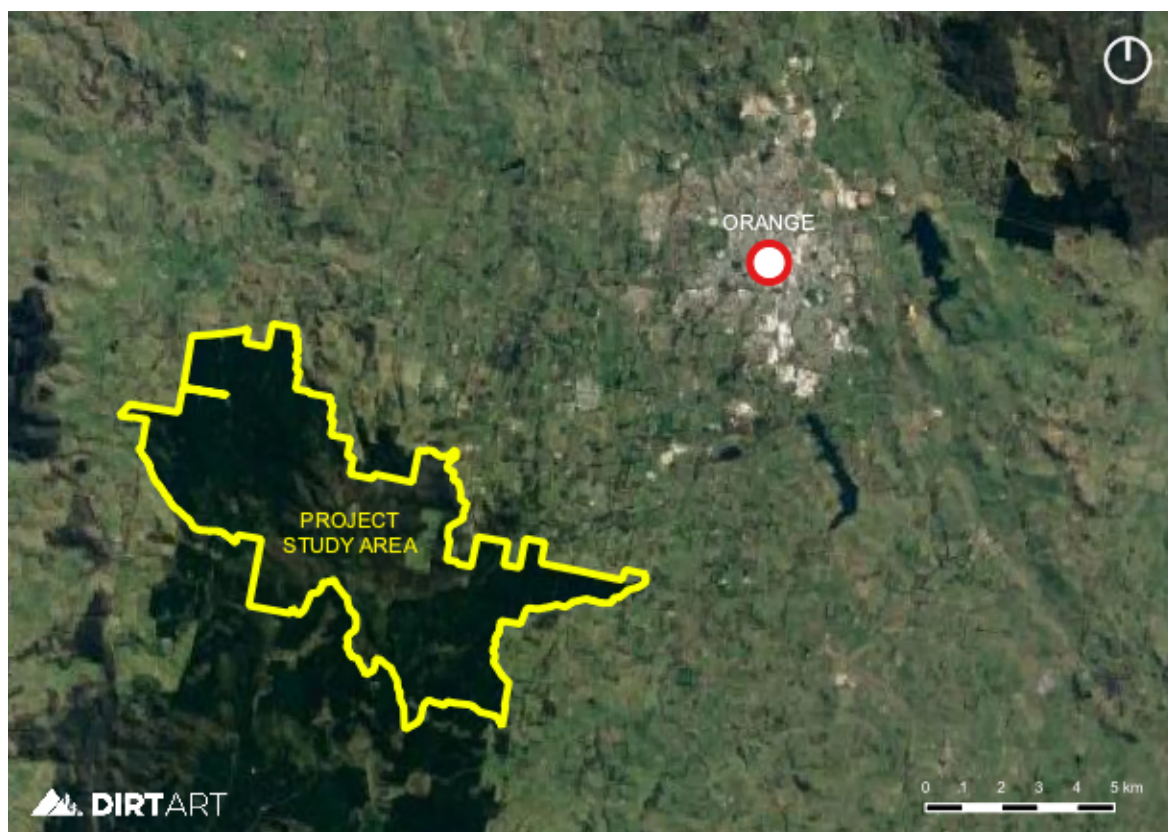


Figure 6 - Project Study Area - Location map

## 4.2 Topography

Average slopes	20-40%
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The lower slopes of the target area are predominantly composed of rolling hills with gentler gradients (20-30%) found towards the north-west of the project study area. The terrain in the higher elevations towards the summit of Mount Canobolas feature some steeper slopes (40%+) with several notable cliff bands found within the State Conservation Area. There are three prominent natural features that attract visitors to the park, these being the 'The Walls', Hopetown Falls, and Federal Falls. Young Man's Mount Canobolas is also an obvious peak located directly to the east of Mount Canobolas and is accessed via a popular walking track.

## 4.3 Geology

The target area is predominately made up of basalt, which is reminiscent of its past as an extinct volcano. As a result, Mount Canobolas is home to variety of interesting geographical features which make up its unique terrain.

The soil types in the target area provide for good trail development opportunities with a good mixture of shaley clay intermixed with areas of rock. Areas with shaley clay will provide a more sustainable trail development opportunity, with more scope to develop mineral earth trail features such as berms and jumps.

## 4.4 Climate

Average annual rainfall	909.6mm (www.bom.gov.au)
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The climate in the project area is generally colder, with summer temperatures in the mid to twenties, and winter temperatures ranging typically between 1.5-11.1°C. Orange is known for its frosty and at times, bitter winters. Annual rainfall is spread relatively evenly across the year, which provides consistent moisture for trails.

It is worthwhile noting that Orange has experienced a series of droughts with the most severe being the millennium drought, which lasted a decade and left the town close to running out of water in 2012. In more recent times, the 2020 drought saw the town's water restrictions being lifted to Level 5. The adverse effects of climate change will continue to be apparent throughout the region with the severity of conditions only set to increase.

For riders, cooler climate and consistent, yet relatively low rainfall provides an excellent climate for year-round riding, albeit colder in the winter months.

## 4.5 Key Threats

### 4.5.1 New Competitors

While there is little current competition in the mountain bike destination marketplace, especially along the NSW coastline, there are a number of emerging and potential developments that may pose potential threats to the project.

- **Glenworth Valley Bike Park**
  - Location: Glenworth Valley, Central Coast NSW
  - Access: Private / Commercial
  - Development:
    - Gravity / Freeride Trails
    - Cross-Country Trails
    - Commercial Shuttle
    - Future Chairlift
    - Accommodation
    - Retail / Amenities
  - Status: Planning Approvals

The development pathway of the Glenworth Valley Bike Park remains unknown, with the project opening now delayed twice. The proponents have yet to announce a third project opening date, and it is understood that planning approvals are yet to be finalised. Given the bike park focus, and lack of certainty around the project proceeding, it is not perceived to be a major threat to the Mount Canobolas Project.

- **Cringila Hills Mountain Bike Park**
  - Location: Wollongong, NSW
  - Access: Public (free) / Council
  - Development:
    - All mountain, cross-country, and freeride trails
    - Skills Area
    - Pump Track
  - Status: Under Construction

The Cringila Hills Project is a small, community-focused urban bike park, which does not compete with the Mount Canobolas Project.

- **Belrose Bike Park**
  - Location: Sydney, NSW
  - Access: Public (free) / Council
  - Development:
    - Gravity / Freeride Trails
    - Dirt Jumps
    - Skills Area
    - Pump Track

- Status: Completed in late 2020

The Belrose Bike Park is an urban bike park with a jump trail and jump park focus. The park caters to a different audience to the Mount Canobolas project so is not seen as an emerging threat.

## 5 Proposed Trail Concepts

### 5.1 Overview

Approximately 104.4km of new mountain bike trails have been proposed in the Mount Canobolas project area with 71.7km (75%) in the Mount Canobolas State Conservation Area (SCA), 27km (28%) in Glenwood State Forest, and the remaining 6.3km (7%) in land managed by Cabonne Shire Council.

There is a strong concentration of trails within the SCA due to the elevational opportunity available within the park and the existing network of established access roads, which make it the ideal location to site a gravity-based trail network. The summit and natural highpoint of Mount Canobolas provides an ideal staging point for riders to be dropped off to enjoy the spectacular 360-degree views and the diverse network of descending trails to suit every level and type of rider from beginner through to expert. There are five distinct trail zones in the network that are listed below:

- Summit Zone
- Eastern Zone
- South-Western Zone
- Western Trail Zone
- North-Western Zone

The proposed development capitalises on the available elevation with a trail network that has a strong gravity focus and preference towards providing easily repeatable and primarily descending opportunities for riders in a range of different trail difficulties, styles, and lengths. A series of cross-country in the eastern zone and all-mountain trail loops to the south-western zone supplement the gravity orientated trail offerings to create an all-inclusive and diverse trail network that caters for a wide demographic of riders. The north-western zone exemplifies the natural ridgeline that runs from the summit of Mt Canobolas through to the lower foothills in Glenwood Forest. For this reason, there is a high concentration of freeride and jump-focused trails that utilise the natural topography and more gradual gradients to create longer descending experiences to link and complement the offerings within the SCA.

### 5.2 Key Objectives

Key objectives when analysing priority new trail developments were as follows:

1. Avoid all 'no go areas' and areas of high sensitivity as defined by the ecological and cultural heritage constraints mapping
2. Develop a strong network focus on shuttle uplift riding with a variety of descending trails to cater for a broad demographic
3. Provide opportunities for a wide range of riding styles, abilities, and distances
4. Develop a stacked loop trail system where possible

5. Place higher impact trails such as freeride/jump trails in areas with lower environmental values or previously disturbed
6. Place trails in areas with reduced social conflicts
7. Minimise crossings of existing roads and tracks
8. Place trails in areas that provide cost effective construction conditions
9. Provide active connections with the local mountain bike club's trail development – existing trails, currently under construction, and planned for the future
10. Environmental safeguards highlighted within the PEIA

### 5.3 Trail Summaries- Proposed Trails

Green Circle (Beginner)	Blue Square (Intermediate)	Black Diamond (Advanced)	Double Black Diamond (Expert)
33.3km	40.7km	22.7km	7.8km
32%	39%	22%	7%

### 5.4 Proposed Trail Types / Zones

#### 5.4.1 Summit Trails

Using the summit of Mount Canobolas as the primary drop-off area, riders have the option to utilise three beginner-friendly trails to access the various gravity and all-mountain trail zones. Trail 12 takes riders across to the east to a cluster of shorter descending trails that exit at the lower Tea House Trailhead. Trail 13 heads off to west, taking riders towards the more technically demanding trails on the western side of Mount Canobolas, or alternatively, to the southern all-mountain trail loops via Trail 14. Finally, Trail 27 heads due north from the summit, weaving its way across to provide access to the freeride/jump trails located in Glenwood State Forest.

Trails:

- Trail 12
- Trail 13
- Trail 27

#### 5.4.2 Cross-Country Trails

Traditional cross-country trails are provided in the north-eastern corner of the network and best accessed via the Tea House Trailhead on the corner of Mount Canobolas Road and Lake Canobolas Road. A series of stacked loops ranging from beginner (Green Circle) through to intermediate (Blue Square) difficulties weave around Watts Pinnacle as well as to the south of Mount Canobolas Road to form an all-encompassing cross-country network.

Northern Trails:

- Trail 1

- Trail 2
- Trail 3
- Trail 4
- Trail 5

Southern Trails:

- Trail 6
- Trail 7

### 5.4.3 Gravity Trails

There are two distinct gravity trail zones in the network, which are defined by their location east and west of Mount Canobolas summit.

The eastern trail zone is characterized by a series of shorter descents ranging from beginner (Green Circle) through to expert (Double Black Diamond) options to ensure all riding abilities are catered for within this area. The shorter nature of these descents is reflective of the available elevation and terrain opportunities in this area. Trail 12 is the only access trail from the summit and is shared amongst all rider abilities and levels. Trail 11 forms the easiest descending option whilst also acting as the primary trail leading to the lower Tea House Trailhead exit.

Eastern Trails:

- Trail 8
- Trail 9
- Trail 10
- Trail 11
- Trail 12

The western trail zone presents riders with more sustained descending options with a greater elevational opportunity on this side of the mountain. The proposed trails take riders through rockier and subsequently more technically demanding terrain. The length of the descents combined with the technical nature of the trails make this zone harder in terms of riding difficulty than the eastern trail zone; offering a natural progression for riders looking to improve their skills and challenge themselves. The landscape has an abundance of natural features making it conducive to creating unique and challenging descents that showcase the area. Trails in this zone will be a major drawcard to Mount Canobolas with a combination of picturesque cliff lines, rocky ridgelines, and a small waterfall that make the trails genuinely stand out as a point of difference from the current trail/destination market.

Western Trails:

- Trail 13
- Trail 19
- Trail 20
- Trail 21
- Trail 22

- Trail 23
- Trail 24
- Trail 25

#### 5.4.4 All-Mountain Trails

There are three extended trail loops proposed in the south-eastern corner of the network that provide an all-mountain experience taking riders through some spectacular terrain while encapsulating some stunning vistas back towards Mount Canobolas and Federal Falls. The trails in this area provide a more isolated and adventure riding experience and well-suited to e-bikes or those individuals seeking the physicality of pedaling their way around.

Trails:

- Trail 14
- Trail 15
- Trail 16
- Trail 17
- Trail 18

#### 5.4.5 Freeride / Jumps Trails

A network of freeride trails have been proposed in the more heavily disturbed areas of Glenwood State Forest to cater for the wider footprint of this style of trail typology, which incorporates larger bike park style trail features such as berms, rollers, jumps and drops. The proposed trail development zone has been recently logged by the land manager, Forestry Corporation of NSW. As such, the area in which trails have been proposed will maximise the timeframe until the next harvest cycle ensues.

Trails:

- Trail 30
- Trail 31
- Trail 32
- Trail 33
- Trail 34
- Trail 35

#### 5.4.6 Existing Trails

There are two existing informal mountain bike trails that have been identified in this concept plan as having the potential to positively contribute to the overall trail network proposed. The first is known as 'Kangaroo Run' with starts off Mitchells Way runs into the second informal trail called 'Rocky Road'. Both trails have been identified as being suitable for inclusion in the concept plan with some minor upgrade works and add significant value to the proposed trail network.

Federal Falls Road is an unsealed road that runs along the lower edge of the western gravity trails. At its southern most point, the existing Galinbundinya trail begins along with a climbing trail that the local mountain club is currently constructing. The proposal has three trails that descending down to Federal Falls Road (Trails 18, 19, and 21) and subsequently benefit from formalizing the route as a two-way access track to be shared with other park users. It forms a relatively flat pedal link between the start of the Galinbundinya trail and Trail Hub D.

Trails:

- Trail 26 (Partial)
  - Part of the proposed Trail 26 alignment recycles the existing 'Kangaroo Run' trail
- Trail 36
- Federal Falls Road (Partial)
  - The part of Federal Falls Road that runs along a north-south alignment has been highlighted as a route to be utilized by riders as a two-way link
- Unnamed Access Track
  - This unsealed track connects Trail Hub D with Mitchells Way to the north
  - The track is suitable as a climbing trail from Trail Hub D, providing pedal access to Trails 29, 30, 31, and 32

## 5.5 Environmental Sensitivities

### 5.5.1 Overview

As a result of the ground-truthing exercise for the proposed trail concepts, a detailed analysis of key sensitivities was mapped and presented to *Dirt Art* from *TEF* and *Apex Archaeology* after their field investigations. Although all known areas of high constraints and 'no go areas' have already been avoided throughout the concept design process, these key sensitivities form an additional layer of ecological and cultural heritage considerations to be avoided, mitigated, or offset during the next stages of the project. They do not represent areas that preclude trails from being developed necessarily, but rather, highlight factors relevant to each trail concept to be mindful of during the next stages of the project.

For the purposes of the concept design, these key site factors are listed per trail and will need to be addressed accordingly in the detailed design stage to ensure the trails are developed in a sustainable way that minimises impacts to these areas, features, species, or communities. Where practical to do so, these key sensitivities are to be avoided in the first instance with minor/major realignments during the process of confirming the final trail alignment to be constructed. In regard to lichen on rock that is located in an area not already identified as an area of high sensitivity or 'no go area' as classified in the project studies, a suitably qualified professional is to undertake testing at strategic locations to determine whether the species is endangered prior to pursuing an appropriate mitigation strategy.

All proposed mitigations strategies are suggested ways of mitigating the potential impact on the various areas, features, species, or communities. They will need to be developed in further detail with specific regard to onsite conditions and limitations.

### 5.5.2 Environmental Sensitivity Table

Abbreviation	Meaning	Proposed Mitigation Strategies
RWL	Rocks with Lichen	<ol style="list-style-type: none"> <li>1. Test Lichen</li> <li>2. Minor Realignment (1-15m)</li> <li>3. Major Realignment (15m+)</li> <li>4. Relocate Affected Rocks</li> </ol>
RO	Rocky Outcrop	<ol style="list-style-type: none"> <li>1. Test Lichen</li> <li>2. Minor Realignment (1-15m)</li> <li>3. Major Realignment (15m+)</li> <li>4. Relocate Affected Rocks</li> </ol>
WB	Wombat Burrow	<ol style="list-style-type: none"> <li>1. Minor Realignment (1-15m)</li> <li>2. Major Realignment (15m+)</li> <li>3. Minimise Disturbance Corridor</li> </ol>
EC	E. Canobolensis	<ol style="list-style-type: none"> <li>1. Minor Realignment (1-15m)</li> <li>2. Major Realignment (15m+)</li> <li>3. Minimise Disturbance Corridor</li> </ol>
WC	Watercourse	<ol style="list-style-type: none"> <li>1. Rock Armouring</li> <li>2. Elevated FRP Platform</li> <li>3. Bridge Structure</li> </ol>
WA	Wet Area	<ol style="list-style-type: none"> <li>1. Minor Realignment (1-15m)</li> <li>2. Rock Armouring</li> <li>3. Elevated FRP Platform</li> </ol>
WF	Waterfall	<ol style="list-style-type: none"> <li>1. Rock Armouring</li> <li>2. Elevated FRP Platform</li> <li>3. Bridge Structure</li> </ol>

### 5.5.3 Environmental Considerations

In conjunction with the sensitivities as listed in the table above, there are several environmental factors that have been considered in the design of the trails to ensure their long-term sustainability and longevity.

Where possible, the following should be considered and implemented:

- Trails to be built in dry and cohesive soils that easily compact and contain a larger percentage of coarse material or rocks that better resist erosion by wind, water, and displacement by human interaction
- Avoid designing or building trails that run parallel or alongside established waterways to reduce the potential for sediment runoff or direct disturbance
- Trail design must not alter the hydrologic functions of waterways
- Avoid level or ford style crossing of waterways by implementing an elevated structure such as a bridge or platform
- Avoid locating trails in low-lying areas or the base of valleys/gullies where they may be prone to flooding or withholding moisture

#### 5.5.4 Trail Construction Examples

A series of construction treatments examples are provided below for trails previously completed in environmentally sensitive areas. These are by no means exhaustive in their nature, but rather, a depiction of trail specific methods of mitigating potential impacts on the environment using best practice trail solutions.

##### 5.5.4.1 Rock Armouring

Rock armouring using locally sourced or imported rock is an effective and robust solution for trail surface hardening. The methodology is typically used in areas that have abundant rock onsite due to the cost constraints associated with importing rock into often remote or inaccessible sites.

Rock armouring is employed to create a hard-wearing riding surface that can withstand the forces of higher impact riding such as those in steeper gradients (10%+) where riders' tires generate more potential energy into the ground. For example, a rider will generally put in a few quick and powerful pedal strokes on the steeper inclines to maintain momentum to successfully negotiate a short pinch climb. The increased torque is more prone to creating erosion or wear and tear on a loose, dirt surface when compared to a textured and hardened rock surface. The same can also be said about a rider descending a steep section of trail where a change of direction or slowing of the riders' speed is required at the bottom of the decline. To slow down quickly, the rider will need to engage their brakes accordingly with a higher likelihood of skidding and displacing the trail surface on a loose surface as opposed to a rock armoured surface. In both cases, it is important to note that the ability of a rider to be consistent with their power delivery to the pedals in the climb and also modulate their brake control in a descent is directly related to the individual skill and experience of the rider.

Another application for rock armouring is to lift the trail tread in low-lying areas or those sections of trail prone to retaining moisture. In some circumstances, realigning the trail from these areas is not a viable option. Hence, rock armouring becomes the best method of creating a sustainable riding surface that is in keeping with the natural environment.



Figure 7 - Extensive rock armoring installed in a lower lying area of trail prone to flooding using imported sandstone (Location: Warimoo Downhill Track, Sydney NSW)



Figure 8 – Rock paving with onsite rock to protect an existing mature tree and affected rootzone (Location: Warimoo Downhill Track, Sydney NSW)

#### 5.5.4.2 Elevated FRP Platform

Where rock armoring is deemed unsuitable or impractical, elevated fiber-reinforced plastic platforms can be installed to elevate the trail tread above the natural ground level. For example, if there is no available onsite rock or there is a requirement to span a gap, elevated platform becomes the best option. The permeable plastic grid is an alternative to the traditional timber boards used to form the platform surface. The benefits of FRP relate to their ease of installation, durability, an ability to allow sunlight to penetrate through its many surface apertures. The stock FRP sheets are cut to size and mechanically fixed to a subframe with a simple clip and screw system of attachment. The subframe can range from prefabricated steel, recycled plastic, or treated timber depending on the application. In scenarios where the platform is required to withstand the loads of construction equipment travelling over the top, such as a mini excavator (1.7t), a steel subframe is the only option. However, in lighter duty applications where it is only limited to bicycle or pedestrian traffic, a timber or plastic subframe will suffice.

In Australia, there is a mixture of various subframes materials utilized throughout mountain bike and walking trails throughout the country. However, the majority of modern-day trail applications unanimously choose FRP as the preferred decking option due the various benefits already mentioned. Many older-style timber boardwalks, mostly found on walking trails, are now in the process of being upgraded to FRP.



Figure 9 – Elevated FRP platform installed to cross an active watercourse (Location: Thredbo Valley Trail, Thredbo NSW)



Figure 10 - Elevated FRP platform crossing between two rock slabs (Location: All Mountain Trail, Thredbo NSW)

### 5.5.4.3 Bridge Structure

Similar to the elevated FRP platforms, bridge structures are typically employed in scenarios where the trail needs to cross a watercourse or deep gully. These are generally installed as low as possible to minimise the exposure and effective fall height risk on either side of the bridge. Anything deemed over 1.2m above the natural ground level will require handrail. Determining the correct height is closely tied with ensuring the bridge does not impede the watercourse during times of high flow.

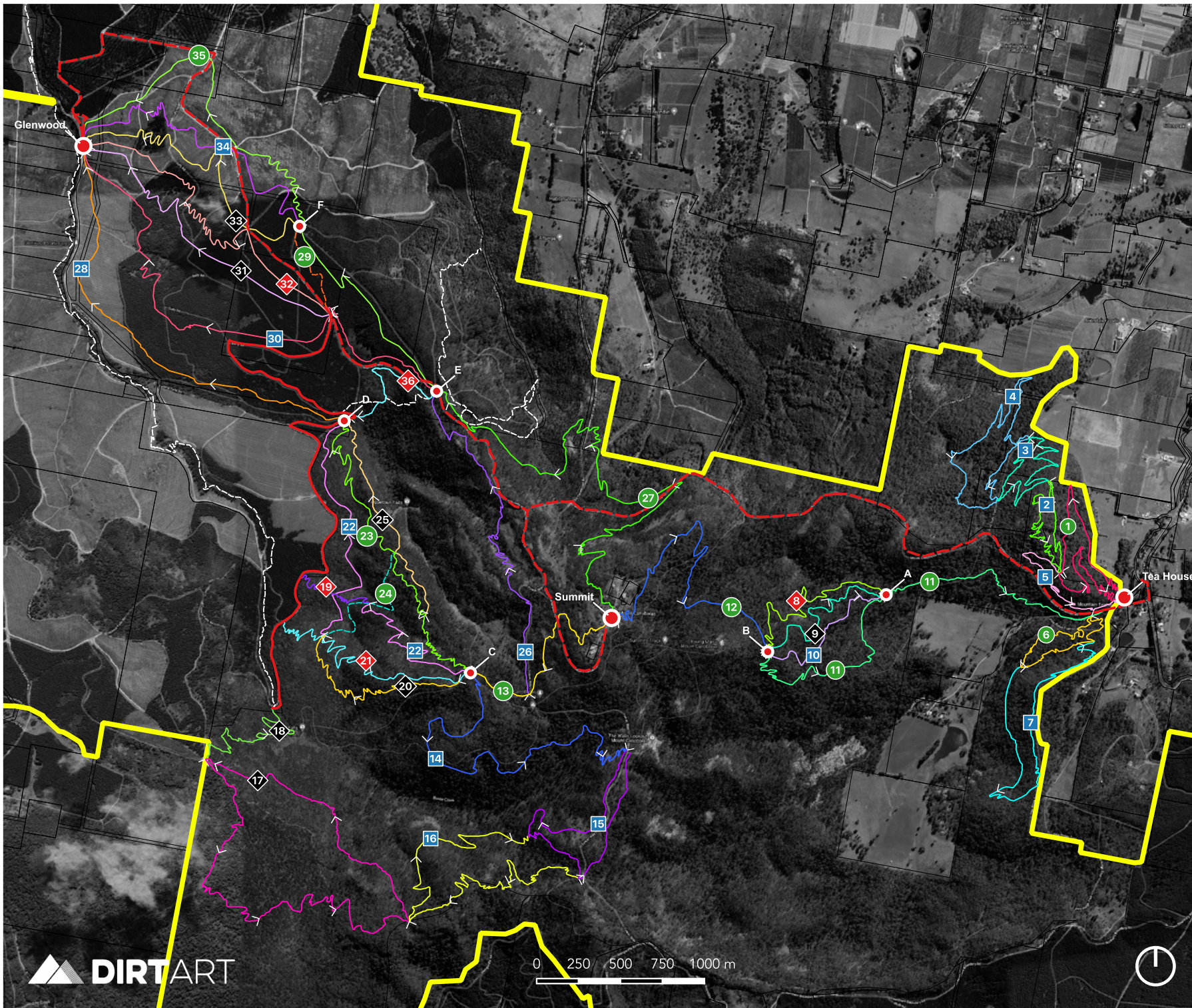


Figure 11 – Bridge structure with handrails to span over a deep and rocky gully (Location: Thredbo Valley Trail, Thredbo NSW)

# Mount Canobolas MTB Project

## TRAIL CONCEPT OVERVIEW MAP

21.06.21

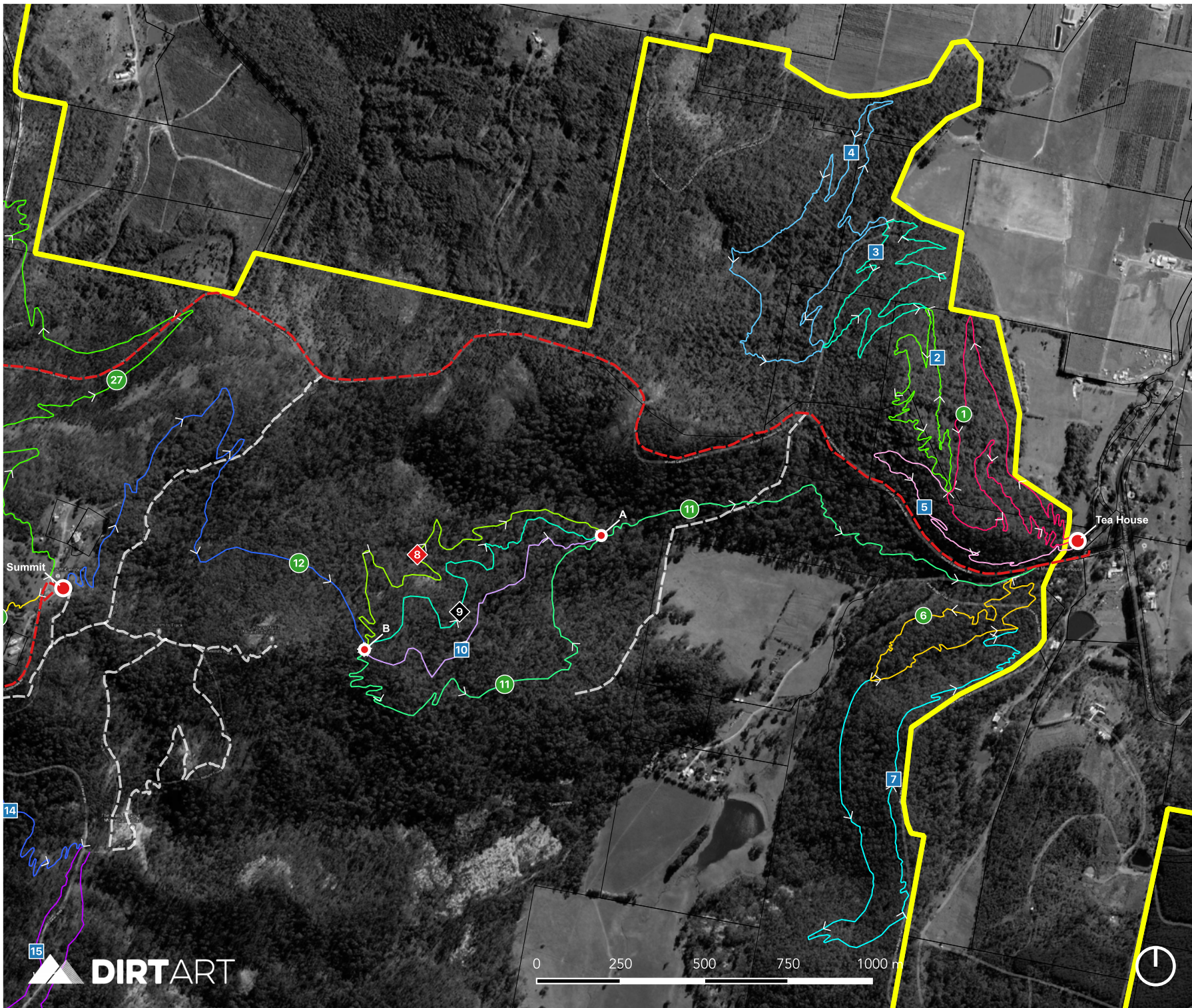


- Proposed Trails
- Trailhead
  - Trail Hub
  - Shuttle Road
  - Road Link
  - C1 - Green Circle
  - C2 - Blue Square
  - C3 - Blue Square
  - C4 - Blue Square
  - C5 - Blue Square
  - C6 - Green Circle
  - C7 - Blue Square
  - C8 - Dbl Black Diamond
  - C9 - Black Diamond
  - C10 - Blue Square
  - C11 - Green Circle
  - C12 - Green Circle
  - C13 - Green Circle
  - C14 - Blue Square
  - C15 - Blue Square
  - C16 - Blue Square
  - C17 - Black Diamond
  - C18 - Black Diamond
  - C19 - Dbl Black Diamond
  - C20 - Black Diamond
  - C21 - Dbl Black Diamond
  - C22 - Blue Square
  - C23 - Green Circle
  - C24 - Green Circle (Two-Way)
  - C25 - Black Diamond
  - C26 - Blue Square
  - C27 - Green Circle
  - C28 - Blue Square
  - C29 - Green Circle (Two-Way)
  - C30 - Blue Square
  - C31 - Black Diamond
  - C32 - Dbl Black Diamond
  - C33 - Black Diamond
  - C34 - Blue Square
  - C35 - Green Circle
  - C36 - Dbl Black Diamond
  - Study Area

# Mount Canobolas MTB Project

## TRAIL CONCEPT: EASTERN ZONE

21.06.21

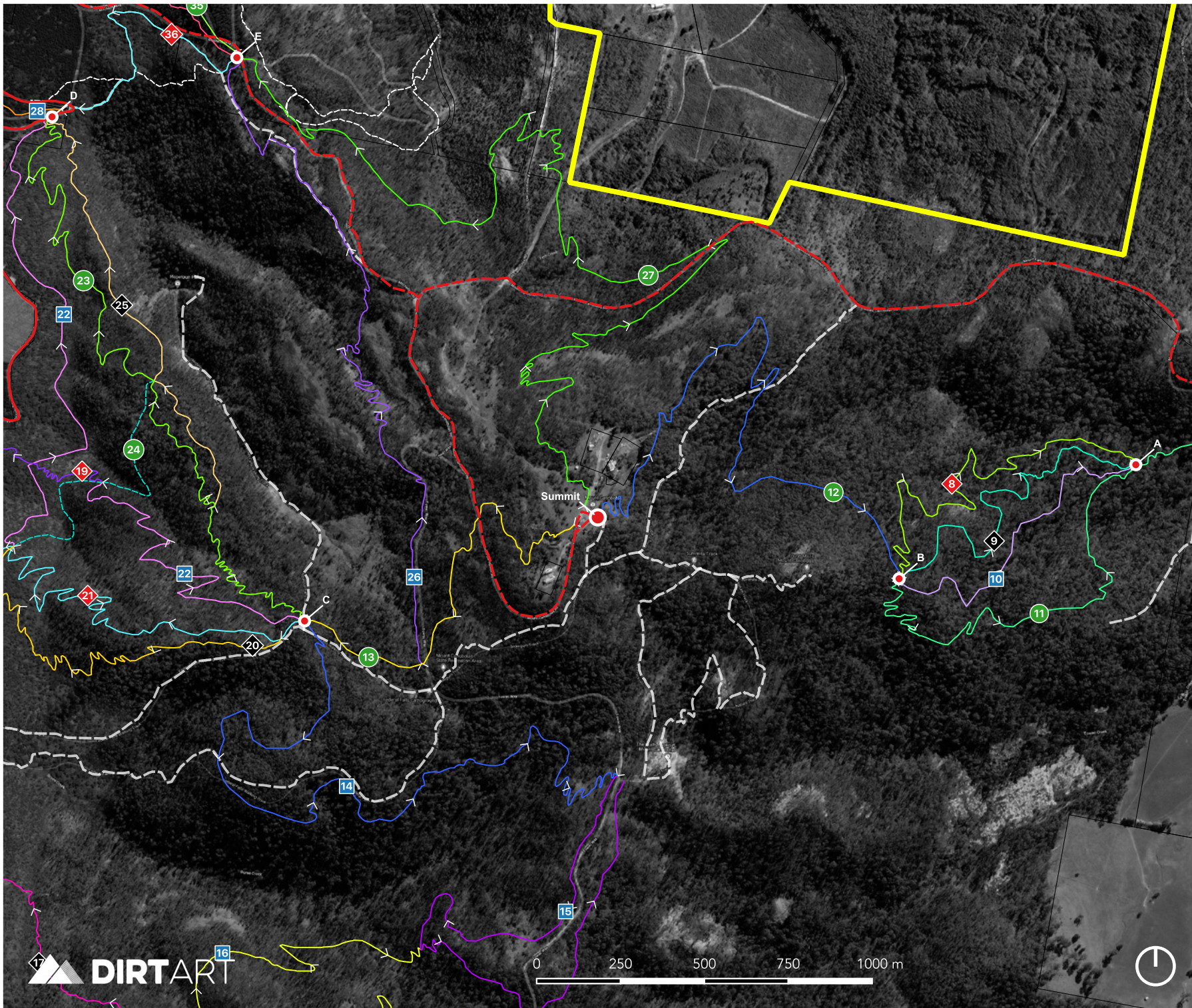


- Proposed Trails
- Trailhead
  - Trail Hub
  - Shuttle Road
  - Road Link
  - C1 - Green Circle
  - C2 - Blue Square
  - C3 - Blue Square
  - C4 - Blue Square
  - C5 - Blue Square
  - C6 - Green Circle
  - C7 - Blue Square
  - C8 - Dbl Black Diamond
  - C9 - Black Diamond
  - C10 - Blue Square
  - C11 - Green Circle
  - C12 - Green Circle
  - C13 - Green Circle
  - C14 - Blue Square
  - C15 - Blue Square
  - C27 - Green Circle
  - Study Area

# Mount Canobolas MTB Project

## TRAIL CONCEPT: SUMMIT ZONE

21.06.21



### Proposed Trails

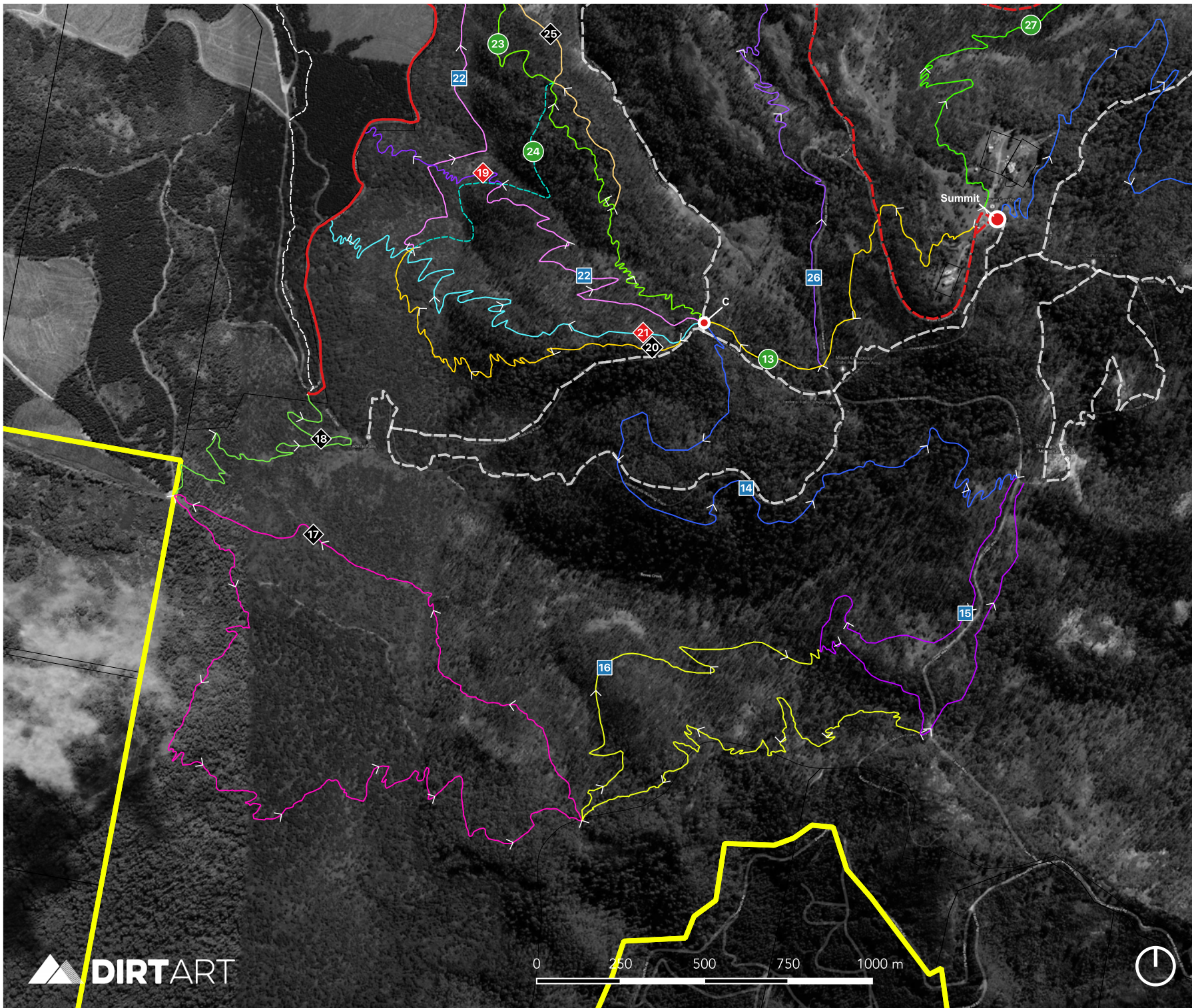
- Trailhead
- Trail Hub
- Shuttle Road
- Road Link
- C1 - Green Circle
- C2 - Blue Square
- C3 - Blue Square
- C4 - Blue Square
- C5 - Blue Square
- C6 - Green Circle
- C7 - Blue Square
- C8 - Dbl Black Diamond
- C9 - Black Diamond
- C10 - Blue Square
- C11 - Green Circle
- C12 - Green Circle
- C13 - Green Circle
- C14 - Blue Square
- C15 - Blue Square
- C16 - Blue Square
- C17 - Black Diamond
- C18 - Black Diamond
- C19 - Dbl Black Diamond
- C20 - Black Diamond
- C21 - Dbl Black Diamond
- C22 - Blue Square
- C23 - Green Circle
- C24 - Green Circle (Two-Way)
- C25 - Black Diamond
- C26 - Blue Square
- C27 - Green Circle
- C28 - Blue Square
- C29 - Green Circle (Two-Way)
- C30 - Blue Square
- C31 - Black Diamond
- C32 - Dbl Black Diamond
- C33 - Black Diamond
- C34 - Blue Square
- C35 - Green Circle
- C36 - Dbl Black Diamond
- Study Area



# Mount Canobolas MTB Project

## TRAIL CONCEPT: SOUTH-WESTERN ZONE

21.06.21



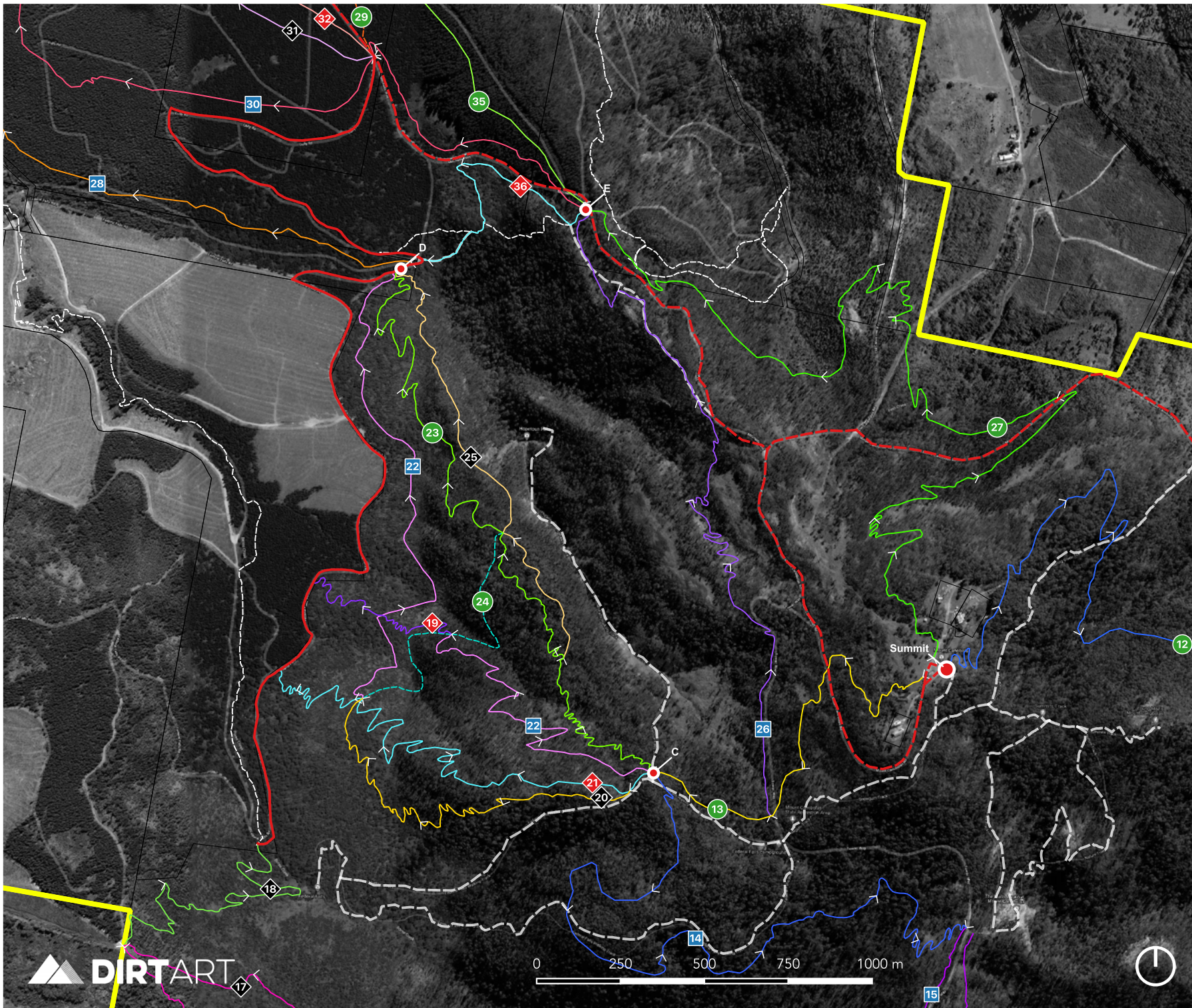
### Proposed Trails

- Trailhead
- Trail Hub
- Shuttle Road
- Road Link
- C12 - Green Circle
- C13 - Green Circle
- C14 - Blue Square
- C15 - Blue Square
- C16 - Blue Square
- C17 - Black Diamond
- C18 - Black Diamond
- C19 - Dbl Black Diamond
- C20 - Black Diamond
- C21 - Dbl Black Diamond
- C22 - Blue Square
- C23 - Green Circle
- C24 - Green Circle (Two-Way)
- C25 - Black Diamond
- C26 - Blue Square
- C27 - Green Circle
- C28 - Blue Square
- Study Area

# Mount Canobolas MTB Project

## TRAIL CONCEPT: WESTERN ZONE

21.06.21



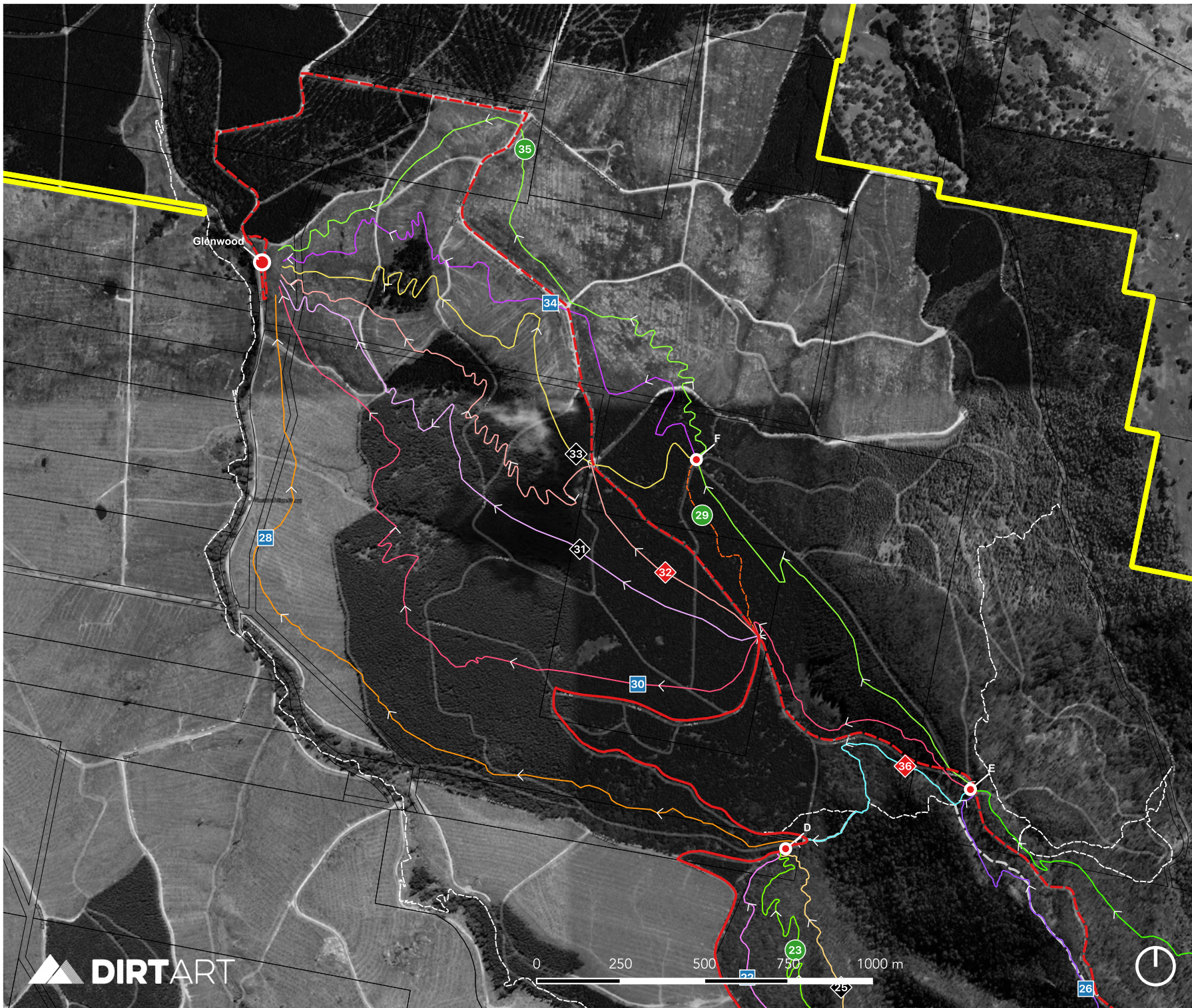
**DIRTART**

- Proposed Trails
- Trailhead
  - Trail Hub
  - Shuttle Road
  - Road Link
  - C12 - Green Circle
  - C13 - Green Circle
  - C14 - Blue Square
  - C15 - Blue Square
  - C16 - Blue Square
  - C17 - Black Diamond
  - C18 - Black Diamond
  - C19 - Dbl Black Diamond
  - C20 - Black Diamond
  - C21 - Dbl Black Diamond
  - C22 - Blue Square
  - C23 - Green Circle
  - C24 - Green Circle (Two-Way)
  - C25 - Black Diamond
  - C26 - Blue Square
  - C27 - Green Circle
  - C28 - Blue Square
  - C29 - Green Circle (Two-Way)
  - C30 - Blue Square
  - C31 - Black Diamond
  - C32 - Dbl Black Diamond
  - C33 - Black Diamond
  - C34 - Blue Square
  - C35 - Green Circle
  - C36 - Dbl Black Diamond
  - Study Area

# Mount Canobolas MTB Project

## TRAIL CONCEPT: NORTH-WESTERN ZONE

21.06.21

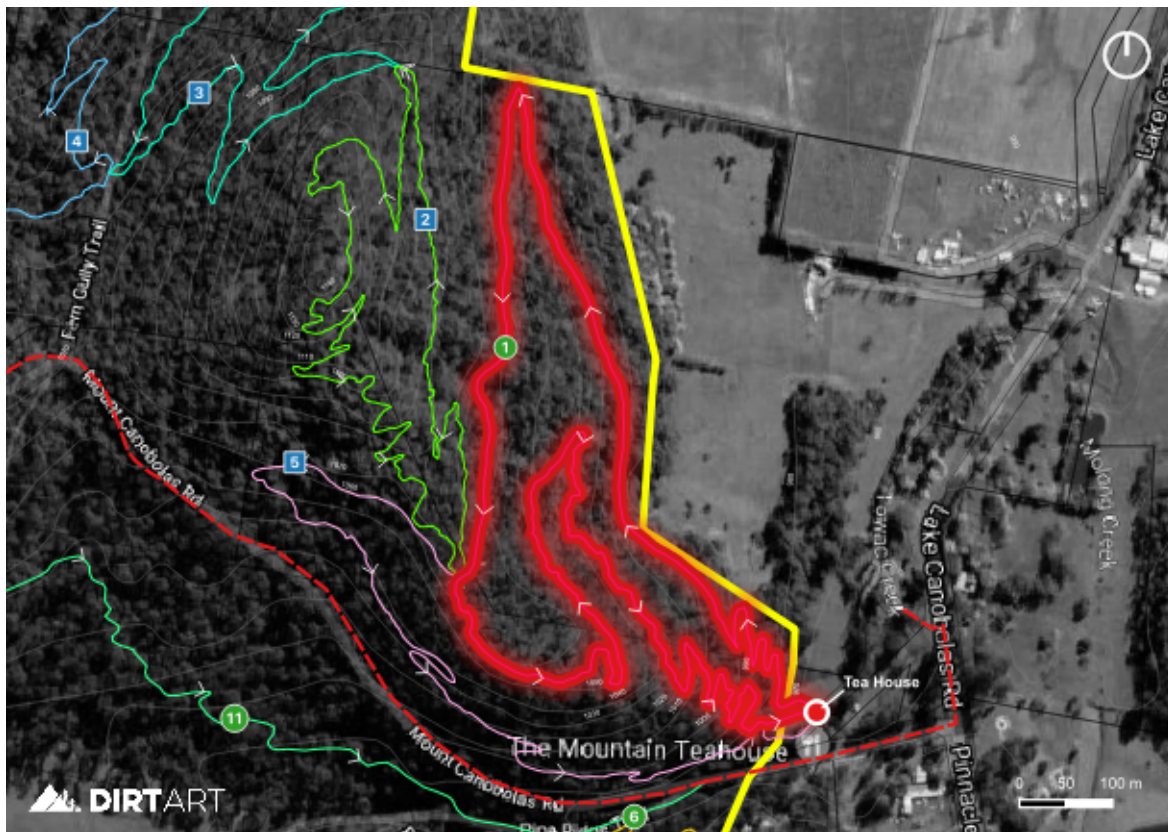


### Proposed Trails

- Trailhead
- Trail Hub
- Shuttle Road
- Road Link
- C22 - Blue Square
- C23 - Green Circle
- C24 - Green Circle (Two-Way)
- C25 - Black Diamond
- C26 - Blue Square
- C27 - Green Circle
- C28 - Blue Square
- C29 - Green Circle (Two-Way)
- C30 - Blue Square
- C31 - Black Diamond
- C32 - Dbl Black Diamond
- C33 - Black Diamond
- C34 - Blue Square
- C35 - Green Circle
- C36 - Dbl Black Diamond
- Study Area

## 5.6 Trail Concepts

### 5.6.1 Trail 1



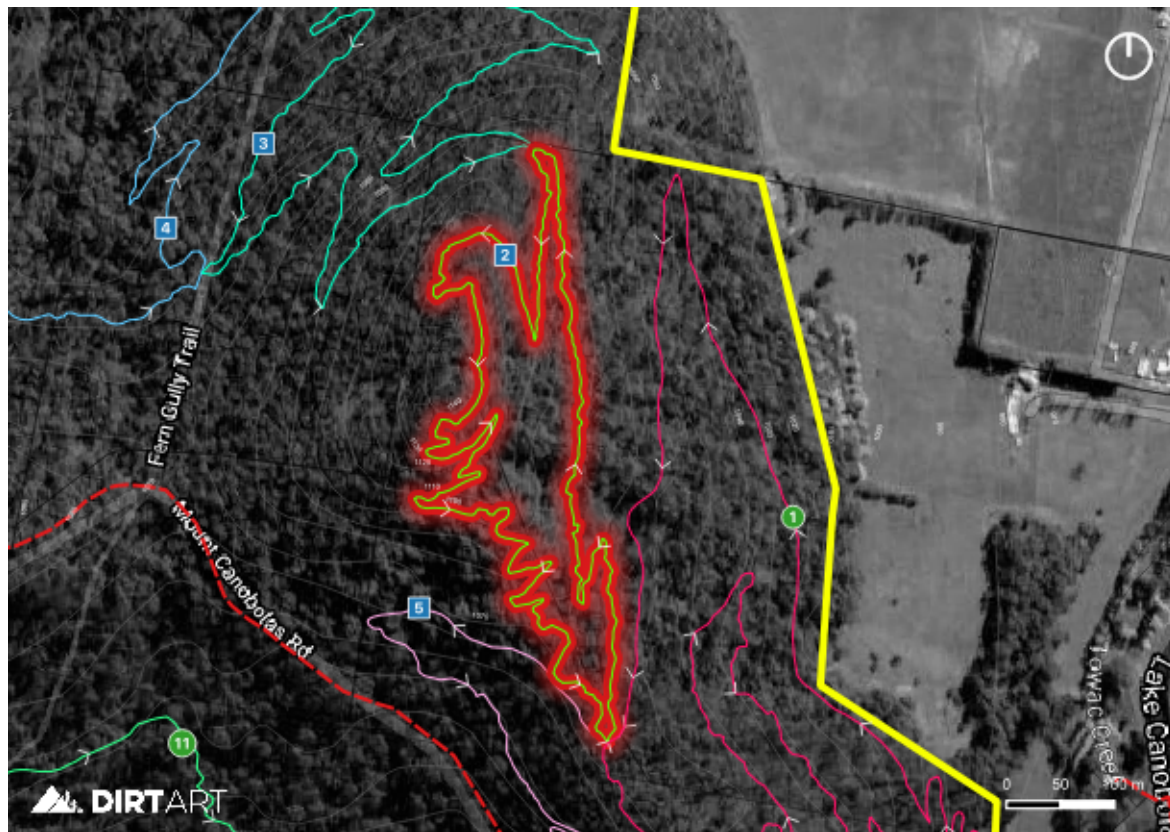
#### Key Statistics

Length	3432m
TDRS (IMBA Rating)	Green Circle
Style	Cross-Country
Format	Loop
Direction	Single Direction / Anti-Clockwise
Width	1,200mm
Land Tenure	NPWS SCA / Cabonne Shire Council
Construction Methodology	Machine-Built
Environmental Sensitivities	WB, RS, RO

#### Trail Concept Overview

Trail 1 is a beginner loop that starts and finishes at the Tea House and ridden in an anti-clockwise direction. The trail begins with a series of uphill switchbacks before taking a gentle, climbing route to the highpoint of the trail on the existing ridgeline where it meets Trails 2 and 5. From here, riders have the choice of utilising these two trail options or alternatively, continuing back down the Trail 1 descent back to towards the trailhead. Trail 1 is part of a series of five inter-connected cross-country trails located to the north-eastern corner of the trail network and primarily accessed via the Tea House Trailhead.

## 5.6.2 Trail 2



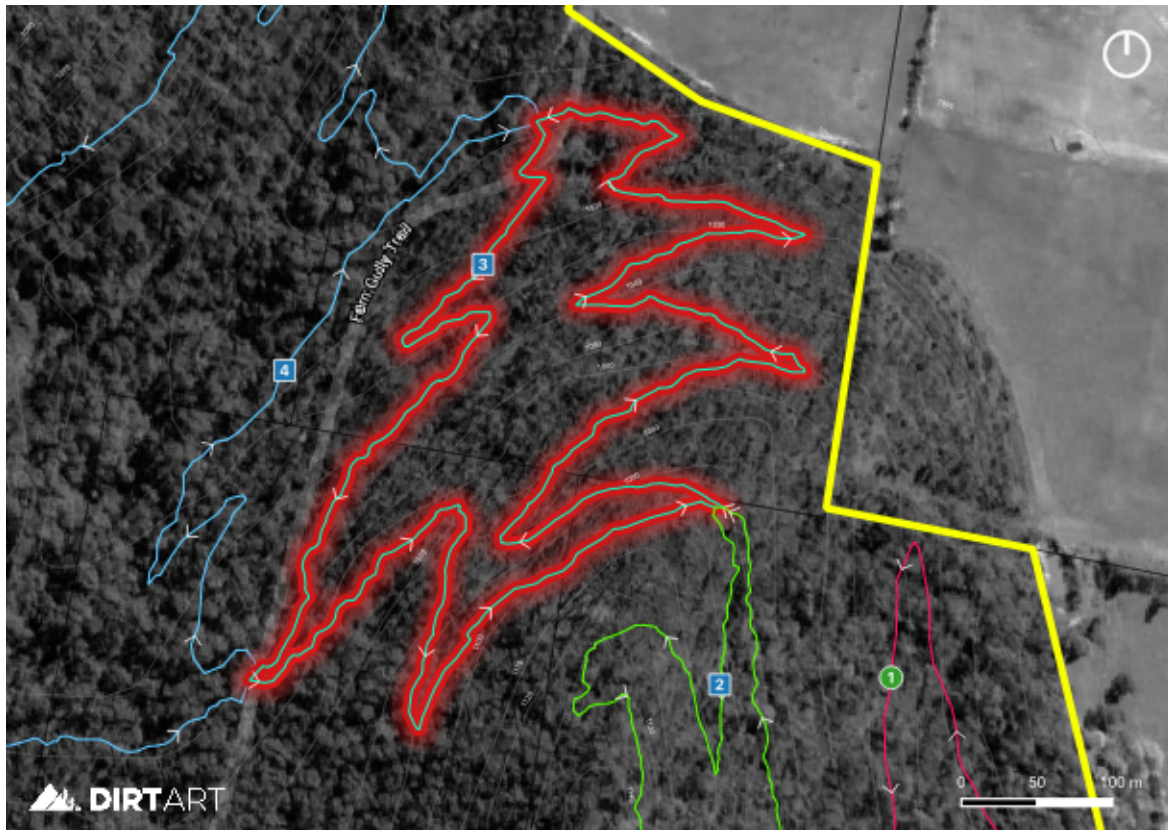
### Key Statistics

Length	2563m
TDRS (IMBA Rating)	Blue Square
Style	Cross-Country
Format	Loop
Direction	Single Direction / Anti-Clockwise
Width	900mm
Land Tenure	Cabonne Shire Council
Construction Methodology	Machine-Built
Environmental Sensitivities	WB, RWL, RO

### Trail Concept Overview

Trail 2 is an intermediate loop that starts and finishes at the junction between Trails 1 and 5 ridden in an anti-clockwise direction. The trail begins in a northerly direction where it meets Trail 3 before climbing up the northern face of the hillside, taking riders up to the summit. From here, a series of flowing switchback corners weaves its way down the ridgeline back towards the start of the trail to the south-east. Trail 2 is part of a series of five inter-connected cross-country trails located to the north-eastern corner of the trail network and primarily accessed via the Tea House Trailhead.

### 5.6.3 Trail 3



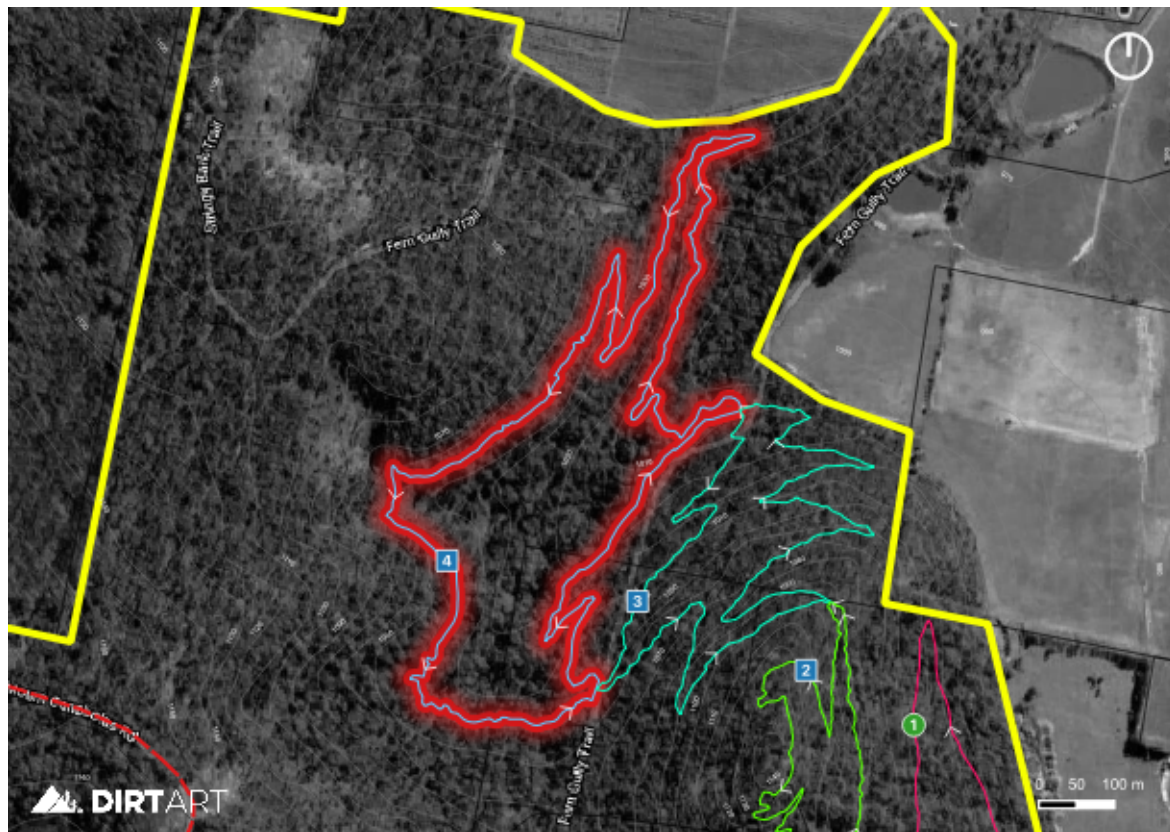
#### Key Statistics

Length	2801m
TDRS (IMBA Rating)	Blue Square
Style	Cross-Country
Format	Loop
Direction	Single Direction / Anti-Clockwise
Width	900mm
Land Tenure	NPWS SCA / Cabonne Shire Council
Construction Methodology	Machine-Built
Environmental Sensitivities	WB, RO, EC

#### Trail Concept Overview

Trail 3 is an intermediate loop that starts and finishes at the junction between Trail 2 and ridden in an anti-clockwise direction. The trail begins with a descent down to its northern junction with the Fern Gully Trail before climbing its way back to the south, where touches the nearby fire trail once again. The two intersections with the Fern Gully Trail allow riders a few different options of integrating Trail 4 partially or entirely into their ride. Trail 3 is part of a series of five inter-connected cross-country trails located to the north-eastern corner of the trail network and primarily accessed via the Tea House Trailhead.

## 5.6.4 Trail 4



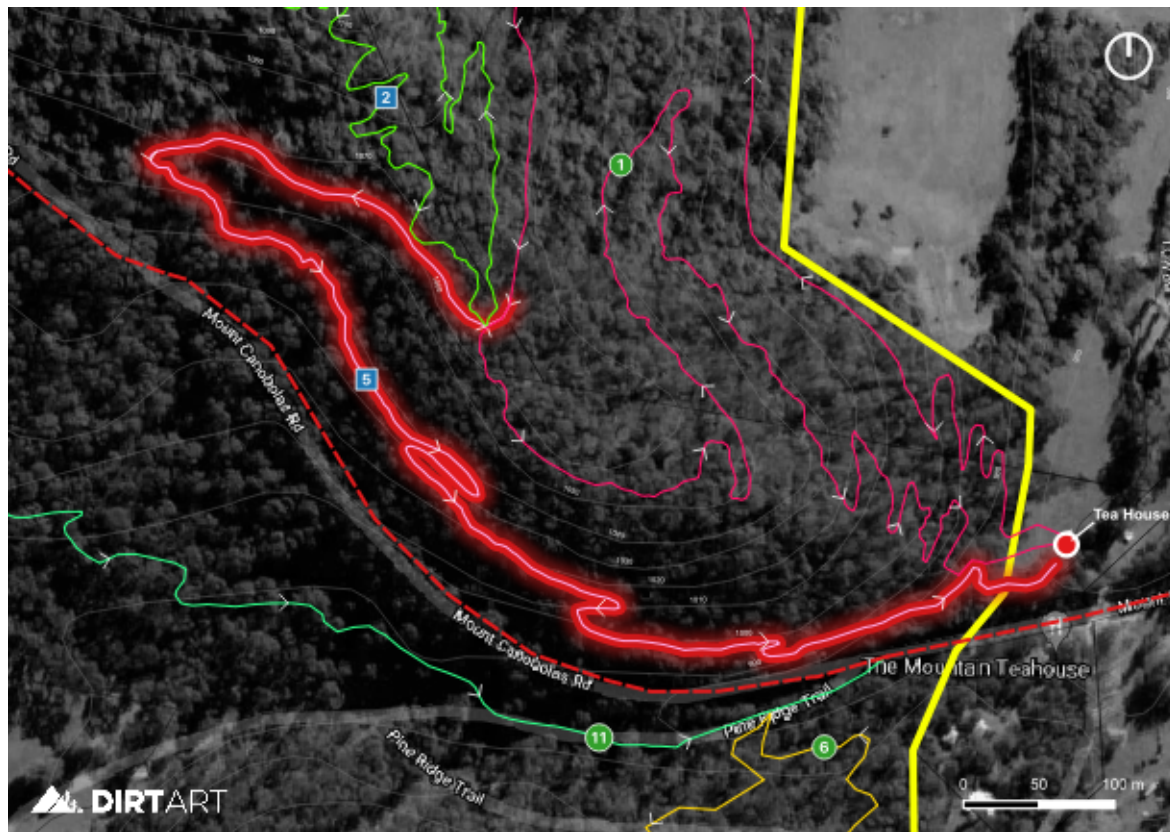
### Key Statistics

Length	3753m
TDRS (IMBA Rating)	Blue Square
Style	Cross-Country
Format	Loop
Direction	Single Direction / Anti-Clockwise
Width	900mm
Land Tenure	NPWS SCA / Cabonne Shire Council
Construction Methodology	Machine-Built
Environmental Sensitivities	WB, WC

### Trail Concept Overview

Trail 4 is an intermediate loop that starts and finishes on the Fern Gully Trail and ridden in an anti-clockwise direction. The trail begins with at the northern intersection with the fire trail and takes riders down to the northern-most point before gradually climbing its way back from the south. Trail 4 is part of a series of five inter-connected cross-country trails located to the north-eastern corner of the trail network and primarily accessed via the Tea House Trailhead.

### 5.6.5 Trail 5



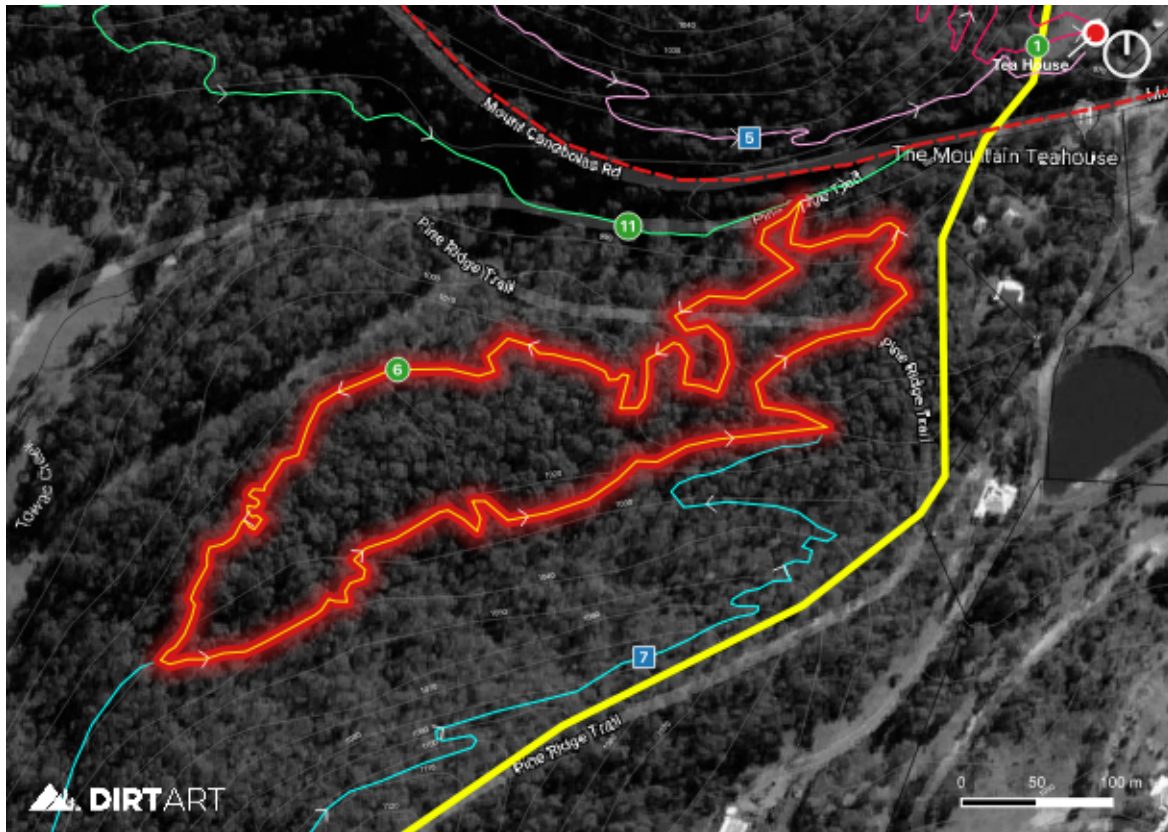
#### Key Statistics

Length	1621m
TDRS (IMBA Rating)	Blue Square
Style	Cross-Country
Format	Descent
Direction	Single Direction
Width	900mm
Land Tenure	NPWS SCA / Cabonne Shire Council
Construction Methodology	Machine-Built
Environmental Sensitivities	WB, RWL, RO

#### Trail Concept Overview

Trail 5 is a beginner to intermediate descent that starts at the junction between Trails 1 and 2 and finishes down at the Tea House Trailhead. The trail provides a progressive trail alternative for beginner riders looking for a more challenging descent and represents a good introduction to an intermediate-level trail. Trail 5 is part of a series of five inter-connected cross-country trails located to the north-eastern corner of the trail network and primarily pedal-accessed via the Tea House Trailhead.

### 5.6.6 Trail 6



#### Key Statistics

Length	2180m
TDRS (IMBA Rating)	Green Circle
Style	Cross-Country
Format	Loop
Direction	Single Direction / Anti-Clockwise
Width	1,200mm
Land Tenure	NPWS SCA
Construction Methodology	Machine-Built
Environmental Sensitivities	WB, RWL, WC

#### Trail Concept Overview

Trail 6 is a beginner loop that starts and finishes off the Pine Ridge Trail and ridden in an anti-clockwise direction. The trail is located on the southern side of Mt Canobolas road from the Tea House Trailhead. Trail 6 is part of two cross-country trails located on the southern side of Mt Canobolas Road that are designed to complement the pedal-accessible offerings from the Tea House Trailhead.

### 5.6.7 Trail 7



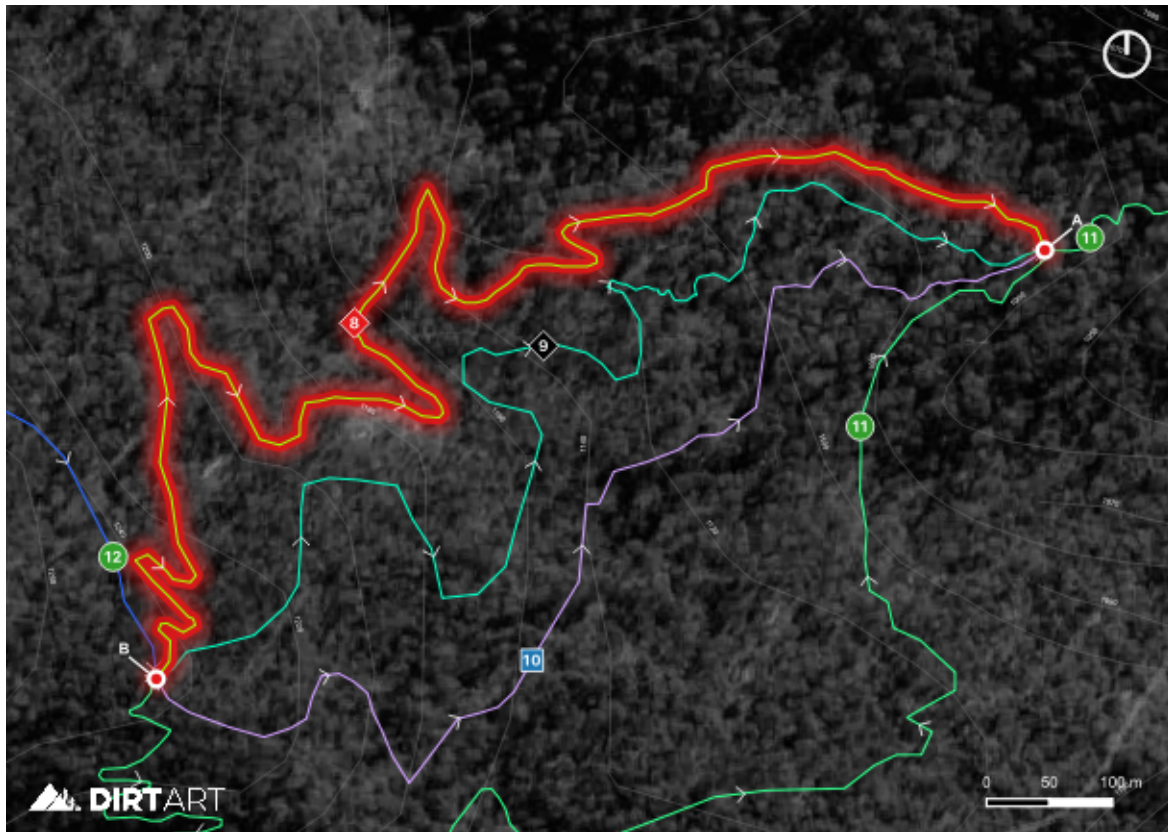
#### Key Statistics

Length	3329m
TDRS (IMBA Rating)	Blue Square
Style	Cross-Country
Format	Loop
Direction	Single Direction / Anti-Clockwise
Width	900mm
Land Tenure	NPWS SCA
Construction Methodology	Machine-Built
Environmental Sensitivities	WB, RWL, EC

#### Trail Concept Overview

Trail 7 is an intermediate loop that starts and finishes off Trail 6 and ridden in an anti-clockwise direction. The trail is located on the southern side of Mt Canobolas road from the Tea House Trailhead. Trail 7 is part of two cross-country trails located on the southern side of Mt Canobolas Road that are designed to complement the pedal-accessible offerings from the Tea House Trailhead.

### 5.6.8 Trail 8



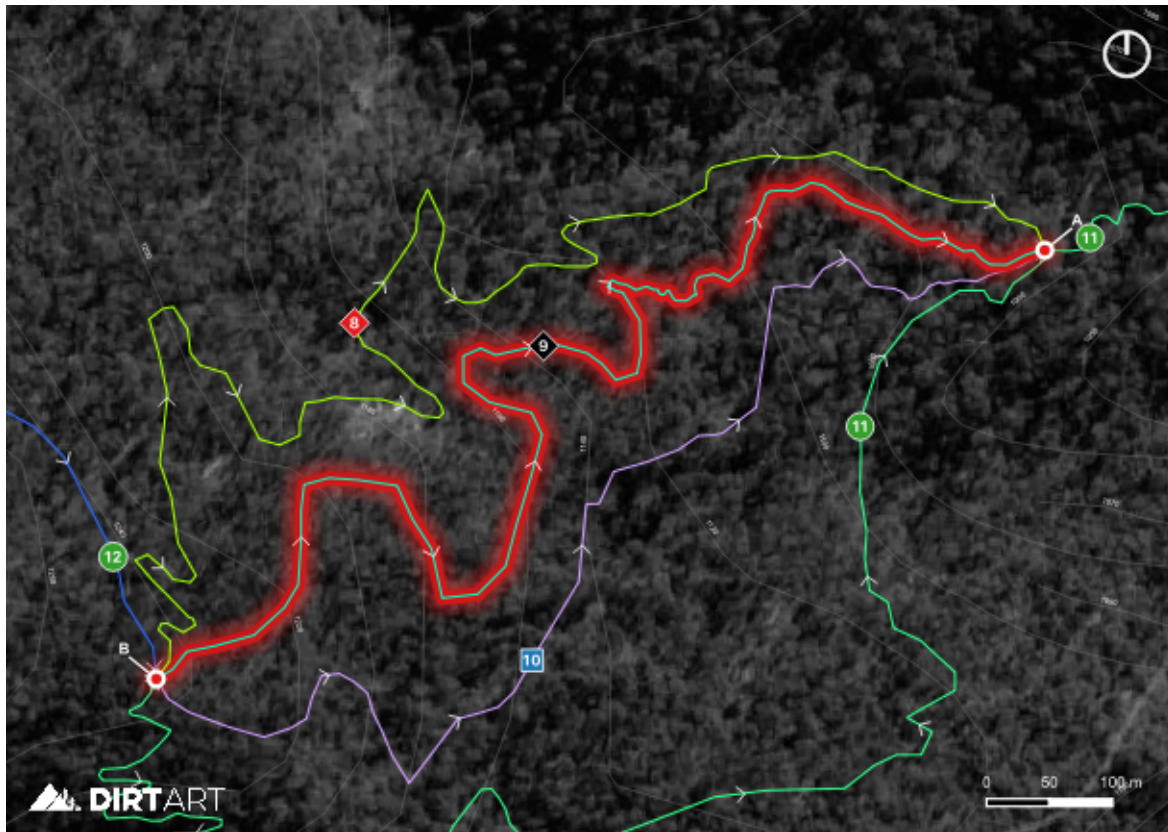
#### Key Statistics

Length	2048m
TDRS (IMBA Rating)	Blue Square
Style	Technical
Format	Descent
Direction	Single Direction
Width	150-900mm
Land Tenure	NPWS SCA
Construction Methodology	Machine-Built
Environmental Sensitivities	WB, RWL, EC

#### Trail Concept Overview

Trail 8 is an expert descent that starts at Trail Hub B and finishes at Trail Hub A. The trail is characterised by a series of natural rocky technical features set to challenge the best riders. Graded as Double Black Diamond, this trail represents the upper end of the IMBA difficulty spectrum and caters for the highly experienced/competent enthusiast mountain biker. It is accessed via Trail 12 from the east and utilises the lower half of Trail 11 to exit at the lower Tea House Trailhead. The trail is designed as part of a cluster of gravity-focused trails to the east of Mt Canobolas that utilize an uplift service to transport riders from the lower Tea House Trailhead (pick-up) back up to the Summit Trailhead (drop-off). A diverse range of trail difficulties are catered for here to ensure there is a trail that suits each riders' respective skill level, while ensuring there is also room for riders to progress their riding safely.

### 5.6.9 Trail 9



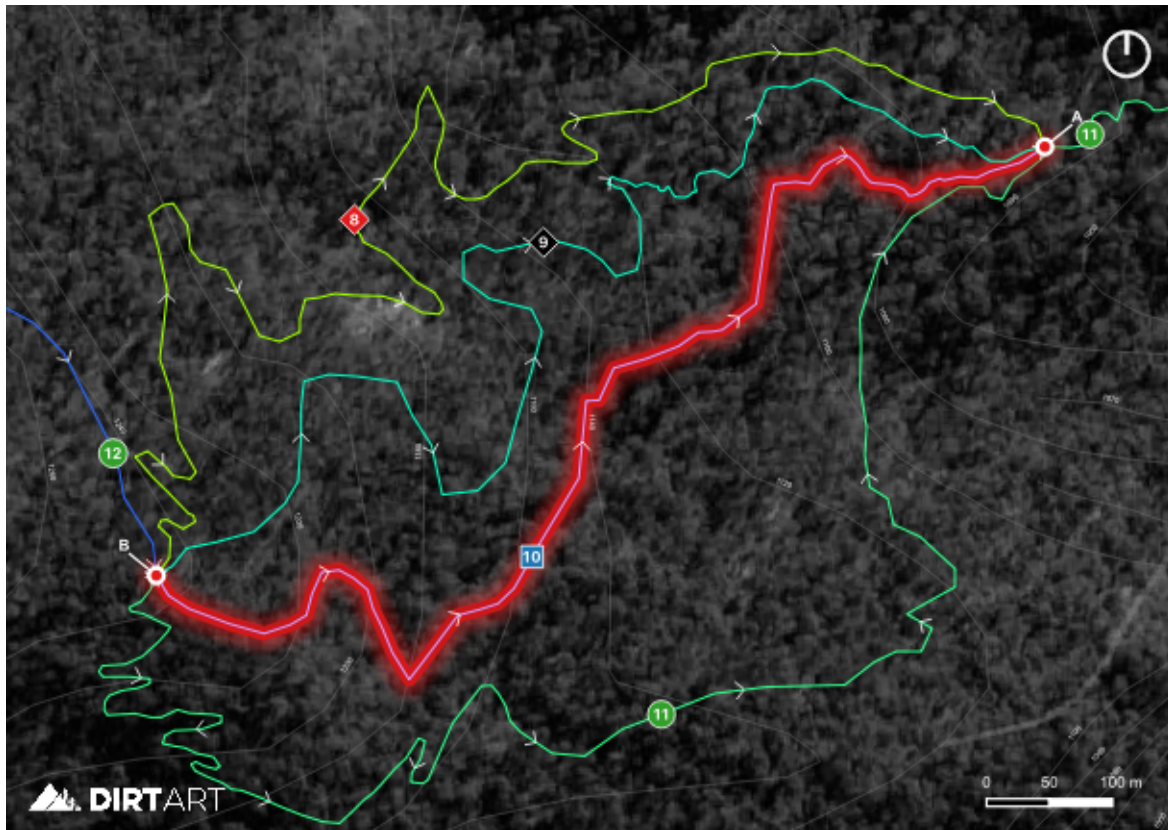
#### Key Statistics

Length	1645m
TDRS (IMBA Rating)	Black Diamond
Style	Technical
Format	Descent
Direction	Single Direction
Width	300-900mm
Land Tenure	NPWS SCA
Construction Methodology	Machine-Built
Environmental Sensitivities	WB, EC

#### Trail Concept Overview

Trail 8 is an advanced descent that starts at Trail Hub B and finishes at Trail Hub A. The trail is characterised by more difficult trail features utilising the natural topography as well as the natural features available within the landscape. It is accessed via Trail 12 from the east and utilises the lower half of Trail 11 to exit at the lower Tea House Trailhead. The trail is designed as part of a cluster of gravity-focused trails to the east of Mt Canobolas that utilise an uplift service to transport riders from the lower Tea House Trailhead (pick-up) back up to the Summit Trailhead (drop-off). A diverse range of trail difficulties are catered for here to ensure there is a trail that suits each riders' respective skill level, while ensuring there is also room for riders to progress their riding safely.

### 5.6.10 Trail 10



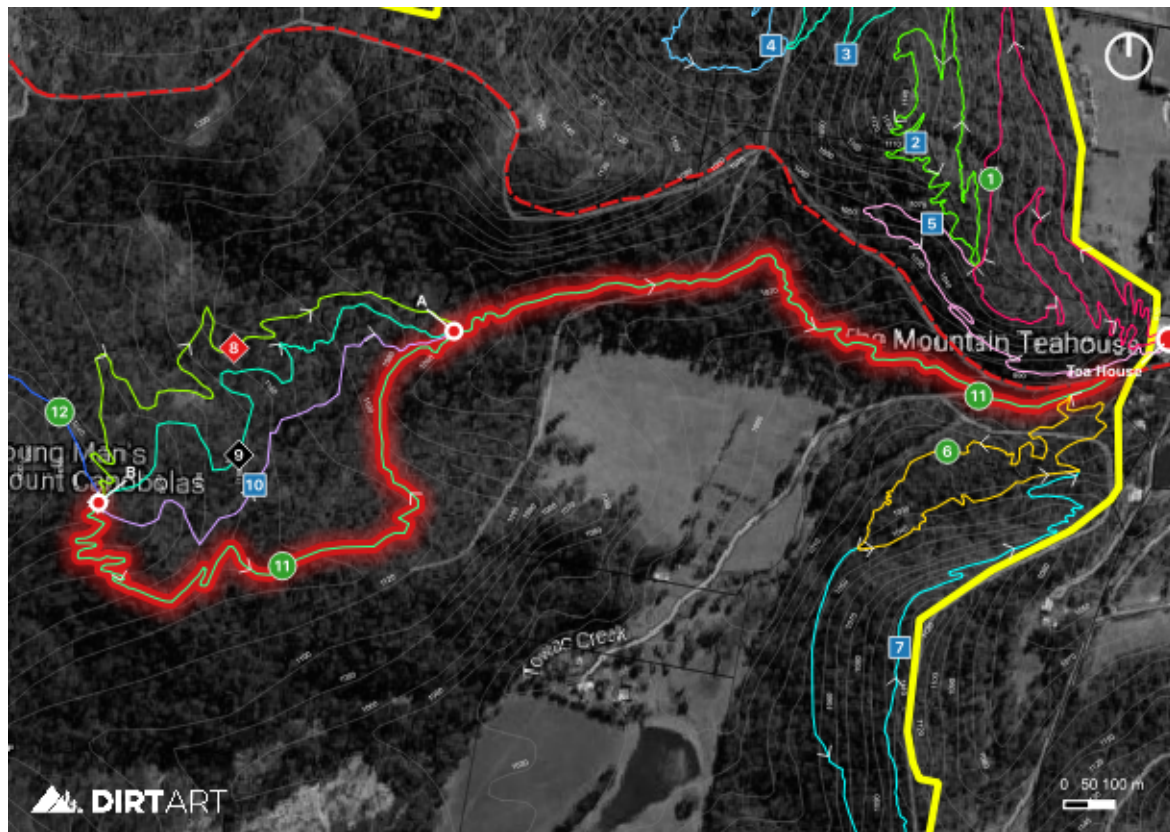
#### Key Statistics

Length	1313m
TDRS (IMBA Rating)	Blue Square
Style	Flow
Format	Descent
Direction	Single Direction
Width	600-900mm
Land Tenure	NPWS SCA
Construction Methodology	Machine-Built
Environmental Sensitivities	EC

#### Trail Concept Overview

Trail 10 is an intermediate descent that starts at Trail Hub B and finishes at Trail Hub A. The trail is characterised by flowing turns following the natural undulations of the land as well as utilising the natural features available within the landscape. It is accessed via Trail 12 from the east and utilizes the lower half of Trail 11 to exit at the lower Tea House Trailhead. The trail is designed as part of a cluster of gravity-focused trails to the east of Mt Canobolas that utilise an uplift service to transport riders from the lower Tea House Trailhead (pick-up) back up to the Summit Trailhead (drop-off). A diverse range of trail difficulties are catered for here to ensure there is a trail that suits each riders' respective skill level, while ensuring there is also room for riders to progress their riding safely.

### 5.6.11 Trail 11



#### Key Statistics

Length	4249m
TDRS (IMBA Rating)	Green Circle
Style	Flow
Format	Descent
Direction	Single Direction
Width	1,200mm
Land Tenure	NPWS SCA
Construction Methodology	Machine-Built
Environmental Sensitivities	WB, RWL, WC

#### Trail Concept Overview

Trail 11 is a beginner descent that starts at Trail Hub B and finishes at Mount Canobolas Road near the Tea House. The trail is a fantastic extension to Trail 12 for beginners and continues the free flowing and gradually descending nature from the summit right through to the lower shuttle pick-up point at the Tea House Trailhead. It is accessed via Trail 12 from the east and utilises the lower half of Trail 11 to exit at the lower Tea House Trailhead. The trail is designed as part of a cluster of gravity-focused trails to the east of Mt Canobolas that utilise an uplift service to transport riders from the lower Tea House Trailhead (pick-up) back up to the Summit Trailhead (drop-off). A diverse range of trail difficulties are catered for here to ensure there is a trail that suits each riders' respective skill level, while ensuring there is also room for riders to progress their riding safely.

## 5.6.12 Trail 12



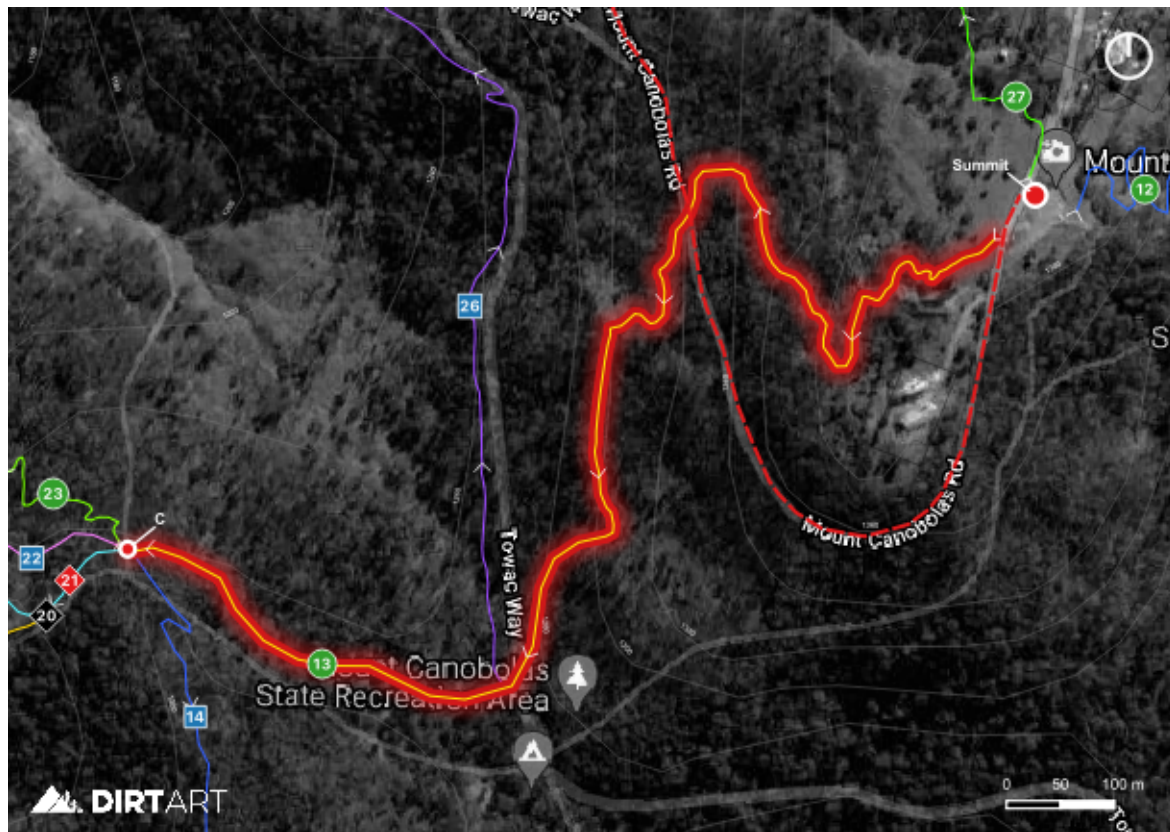
### Key Statistics

Length	2943m
TDRS (IMBA Rating)	Green Circle
Style	Flow
Format	Descent
Direction	Single Direction
Width	1,200mm
Land Tenure	NPWS SCA
Construction Methodology	Machine-Built
Environmental Sensitivities	WB, RWL, EC, WC

### Trail Concept Overview

Trail 12 is a beginner descent that starts at the summit of Mount Canobolas and finishes at Trail Hub B. The trail is designed as the primary connection to the eastern gravity trail zone leading towards the lower Tea House Trailhead and suitable for all off-road rider abilities. A single trail is shared amongst the various levels of riders as it traverses an area that is highly constrained with various sensitive ecological and cultural heritage values. The proposed concept alignment avoids all known sensitivities, including generous buffers/offsets from these areas to ensure any potential impacts are avoided.

### 5.6.13 Trail 13



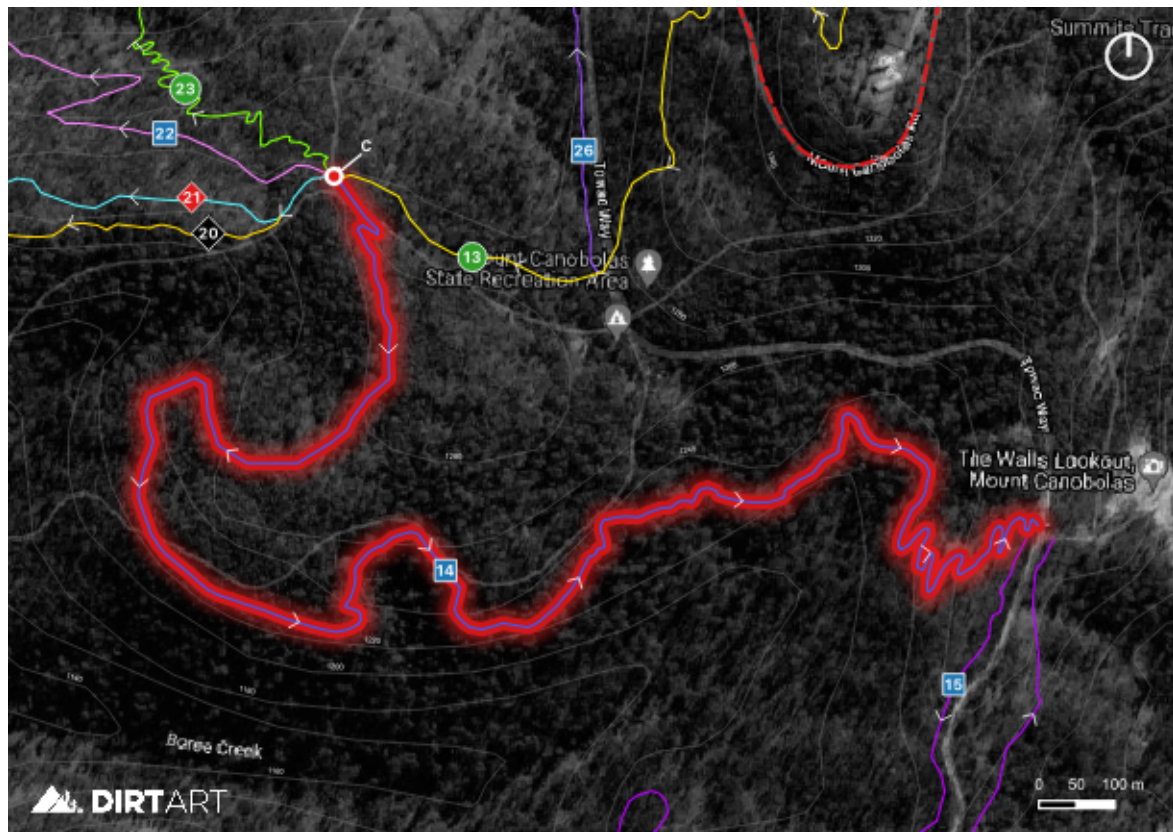
#### Key Statistics

Length	1780m
TDRS (IMBA Rating)	Green Circle
Style	Flow
Format	Descent
Direction	Single Direction
Width	1,200mm
Land Tenure	NPWS SCA
Construction Methodology	Machine-Built
Environmental Sensitivities	RWL, EC, WB

#### Trail Concept Overview

Trail 13 is a beginner descent that starts at the summit of Mount Canobolas and finishes at Trail Hub C. The trail is designed as the primary connection to the western gravity trail zone leading towards Federal Falls Road and Trail Hub D. It is suitable for all off-road rider abilities. A single trail is shared amongst the various levels of riders as it descends off the summit through an area that is highly constrained with various cultural heritage sensitivities. The proposed concept alignment avoids all known sensitivities, including generous buffers/offsets from these areas to ensure any potential impacts are avoided.

## 5.6.14 Trail 14



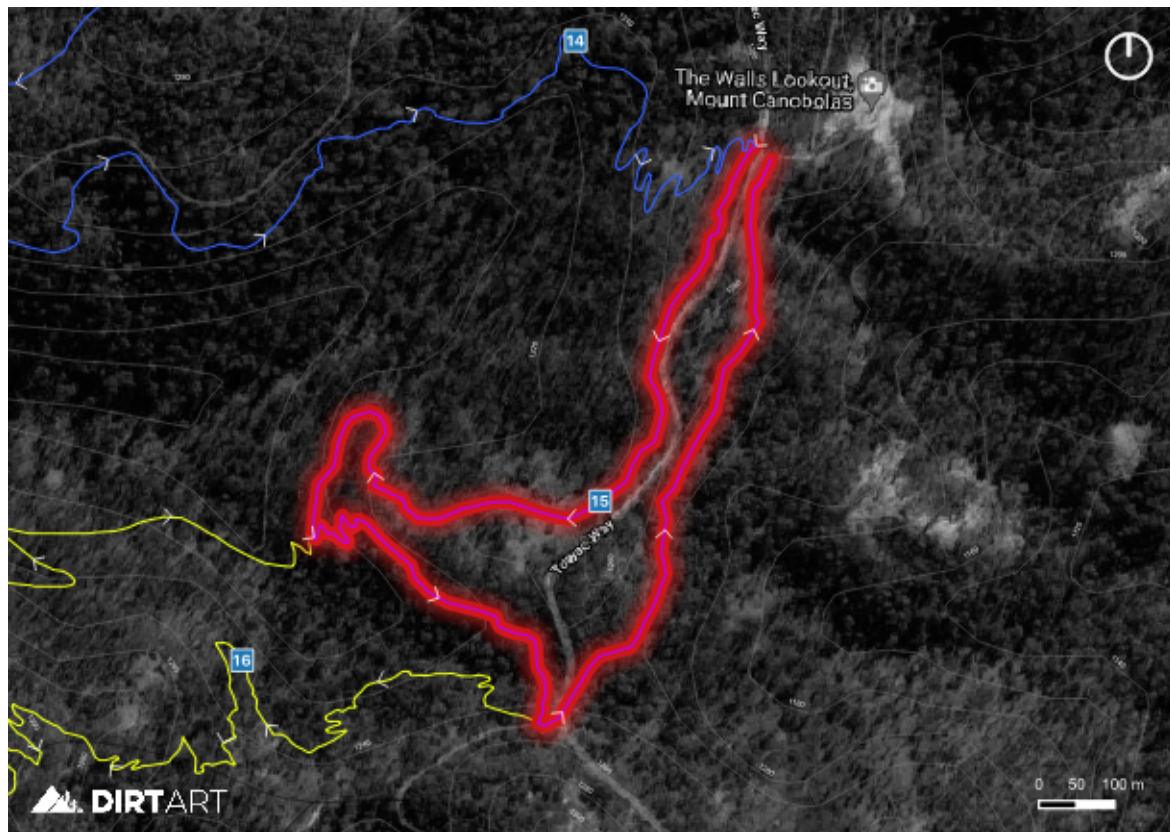
### Key Statistics

Length	3721m
TDRS (IMBA Rating)	Blue Square
Style	All-Mountain
Format	Descent / Climb
Direction	Single Direction
Width	600-900mm
Land Tenure	NPWS SCA
Construction Methodology	Machine-Built
Environmental Sensitivities	EC, RO, WB, WC, RWL

### Trail Concept Overview

Trail 14 is an intermediate trail that starts at Trail Hub C and wraps around the existing southern ridgeline to take riders across to The Walls. The trail is designed to provide access to the more remote and backcountry riding experiences to the south with the extended Trail 15, 16 and 17 loops.

### 5.6.15 Trail 15



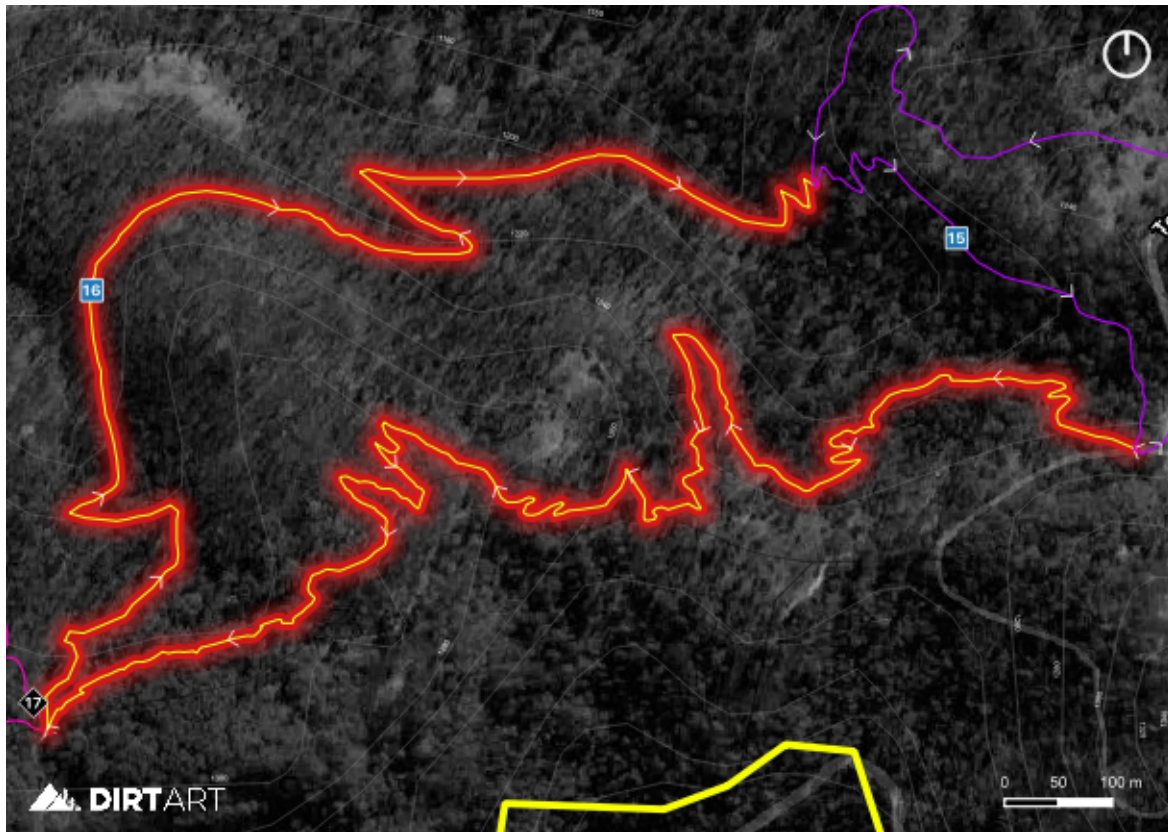
#### Key Statistics

Length	3117m
TDRS (IMBA Rating)	Blue Square
Style	All-Mountain
Format	Loop
Direction	Single Direction / Anti-Clockwise
Width	600-900mm
Land Tenure	NPWS SCA
Construction Methodology	Machine-Built
Environmental Sensitivities	RO, EC, RWL,

#### Trail Concept Overview

Trail 15 is an intermediate trail loop that starts and finishes at The Walls. The trail is designed to be ridden in conjunction with the more remote and backcountry riding experiences in the south-western corner of the proposed network.

### 5.6.16 Trail 16



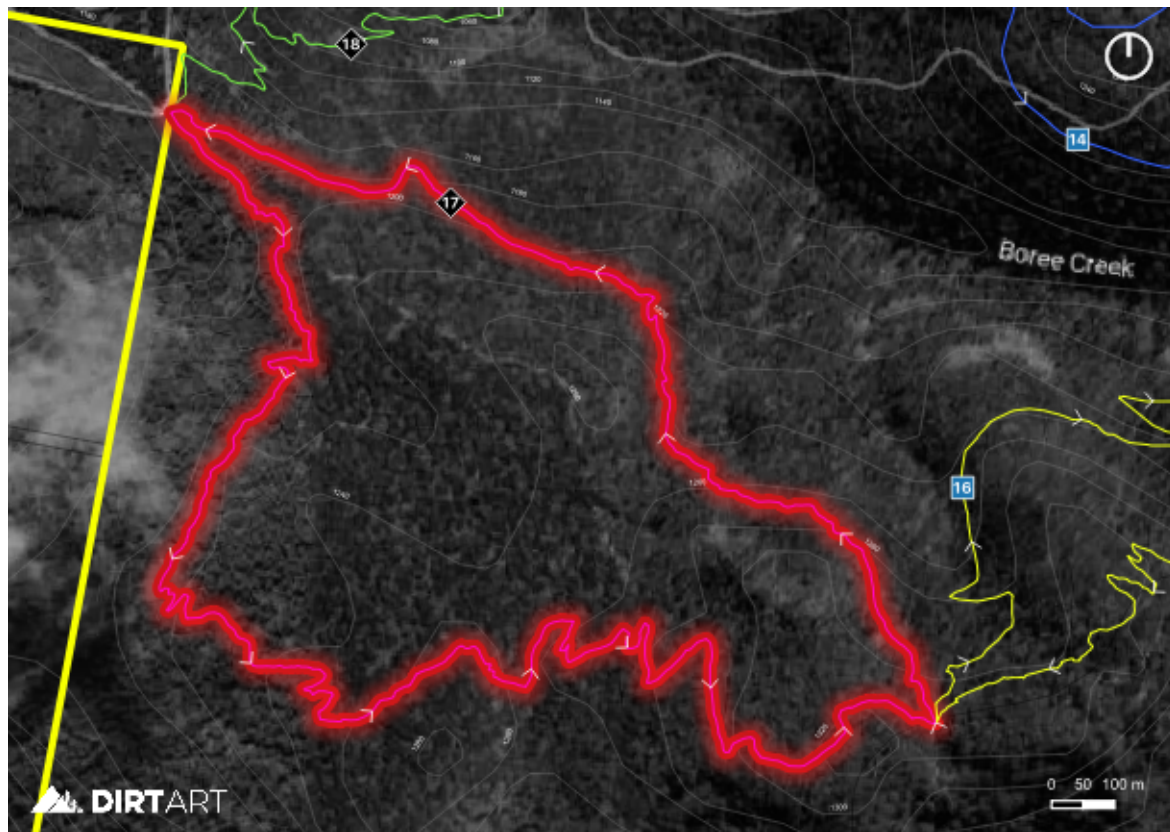
#### Key Statistics

Length	4678m
TDRS (IMBA Rating)	Blue Square
Style	All-Mountain
Format	Loop
Direction	Single Direction / Anti-Clockwise
Width	600-900mm
Land Tenure	NPWS SCA
Construction Methodology	Machine-Built
Environmental Sensitivities	WB, EC, RWL

#### Trail Concept Overview

Trail 16 is an intermediate trail loop that starts and finishes on Trail 15. The trail is designed to be ridden in conjunction with the more remote and backcountry riding experiences in the south-western corner of the proposed network. Riders will be taken through a stunning and rocky landscape with incredible vistas back towards Mount Canobolas to the north as well as down towards Federal Falls to the north-west.

### 5.6.17 Trail 17



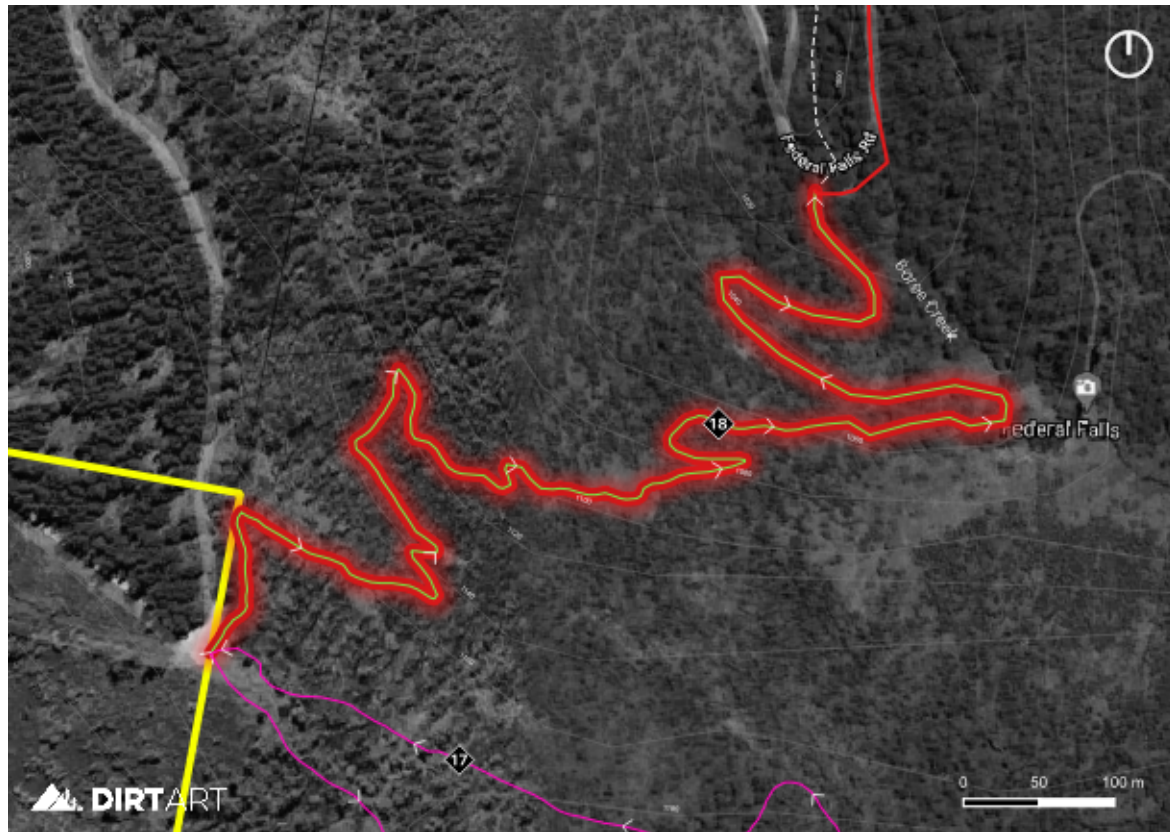
#### Key Statistics

Length	6362m
TDRS (IMBA Rating)	Black Diamond
Style	All-Mountain
Format	Loop
Direction	Single Direction / Anti-Clockwise
Width	300-900mm
Land Tenure	NPWS SCA
Construction Methodology	Machine-Built
Environmental Sensitivities	RWL, EC, RO, WC

#### Trail Concept Overview

Trail 17 is an advanced trail loop that starts and finishes off the western junction of Trail 16 and the existing fire trail. The trail is characterised by a technical descent through a series of natural rocky features, which will be intermixed with more flowy sections of trail. Riders will be taken through a stunning and rocky landscape with incredible vistas down towards Federal Falls to the north. It has been designed to provide a more remote wilderness riding experience as well as connecting into the local mountain bike club's climbing trail, which is still in construction at the southern end of the existing Galinbundinya Trail. Trail 18 will also complement the club's future trail proposals in Forestry land.

## 5.6.18 Trail 18



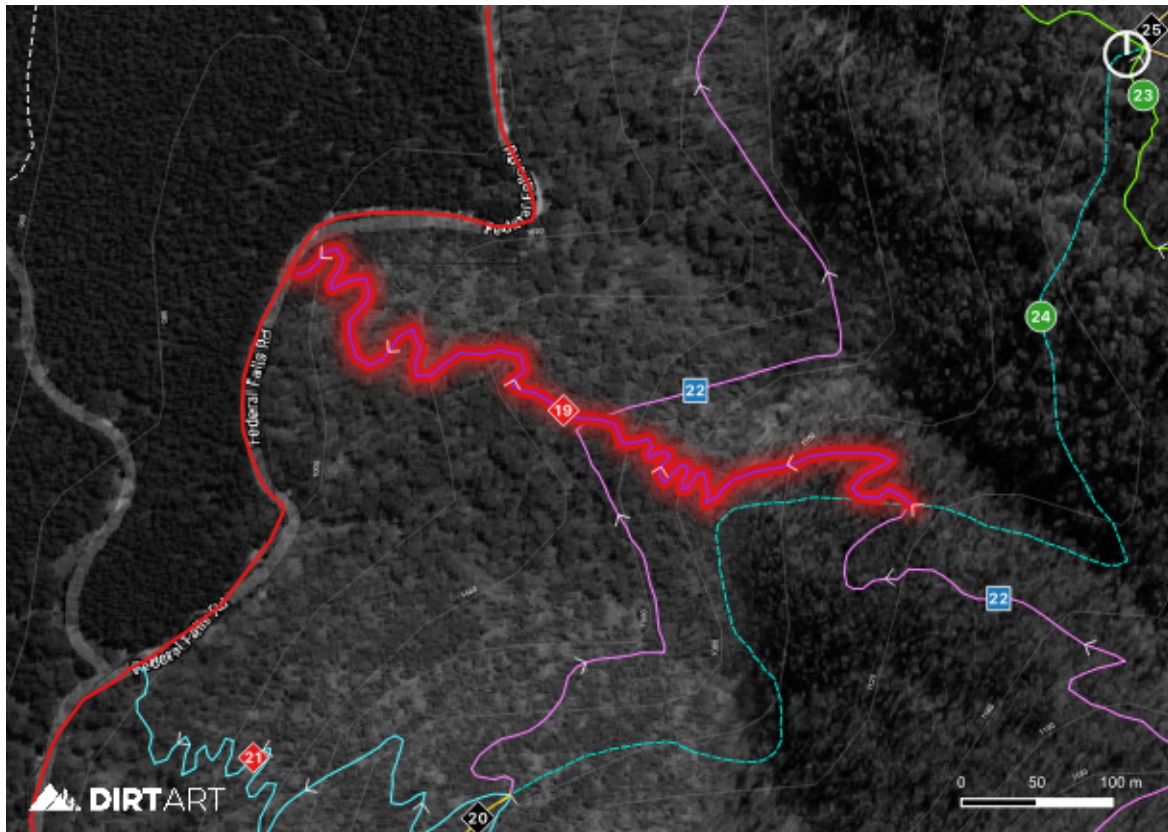
### Key Statistics

Length	1871m
TDRS (IMBA Rating)	Black Diamond
Style	Technical
Format	Descent
Direction	Single Direction
Width	300-900mm
Land Tenure	NPWS SCA
Construction Methodology	Machine-Built
Environmental Sensitivities	RWL, EC

### Trail Concept Overview

Trail 18 is an advanced descent that starts at Trail 17's junction with the existing fire trail and finishes at the southern end of the existing Galinbundinya Trail. The trail is characterised as a rocky and challenging technical descent that takes riders close to the stunning Federal Falls before wrapping back down towards the lower Federal Falls Road. Trail 18 will complement the climbing trail that is currently under construction by the local mountain bike club as well as their future trail proposals in Forestry land.

## 5.6.19 Trail 19



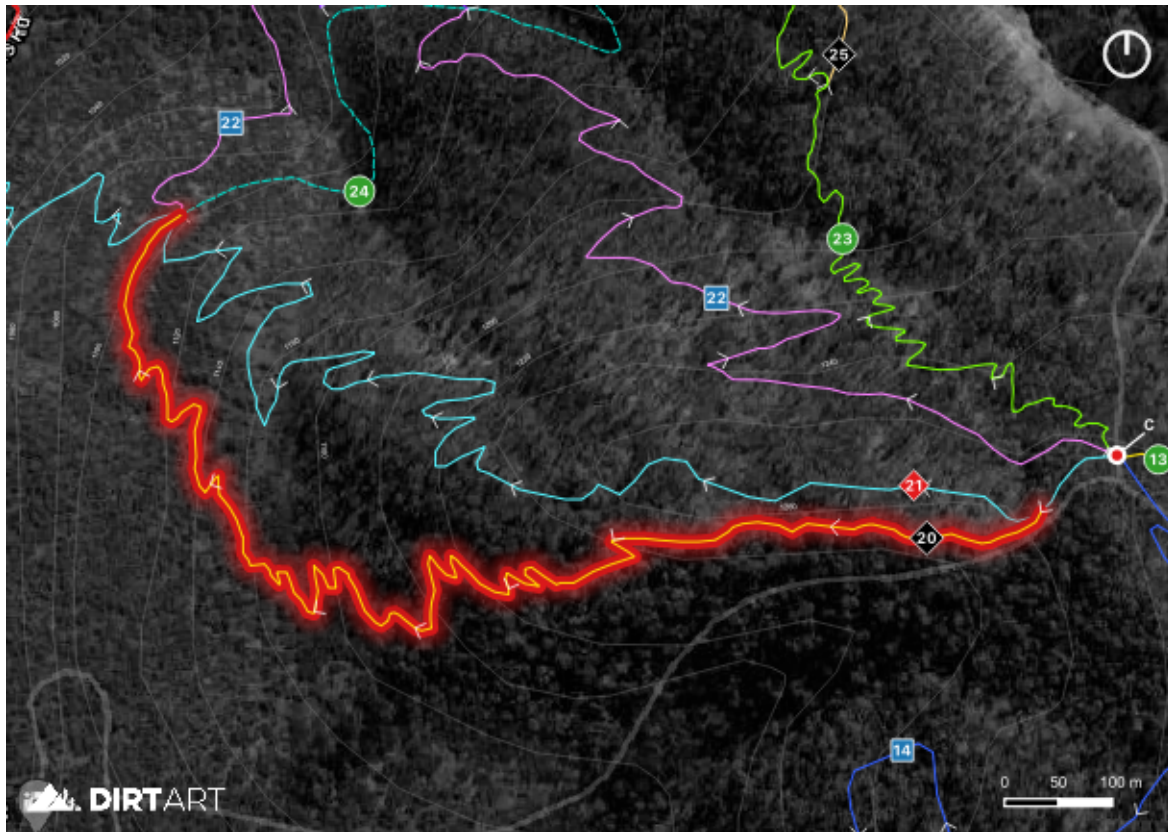
### Key Statistics

Length	949m
TDRS (IMBA Rating)	<b>Double Black Diamond</b>
Style	Technical
Format	Descent
Direction	Single Direction
Width	150-900mm
Land Tenure	NPWS SCA
Construction Methodology	Machine-Built
Environmental Sensitivities	RWL, WB

### Trail Concept Overview

Trail 19 is an expert descent that starts at the junction between Trails 22/24 and finishes down on Federal Falls Road. The trail is characterised by the steep and rocky ridgeline, which is set to challenge the best riders. Graded as Double Black Diamond, this trail represents the upper end of the IMBA difficulty spectrum and caters for the highly experienced/competent enthusiast mountain biker. This trail is designed as part of a cluster of gravity-focused trails to the west of Mt Canobolas that utilise an uplift service to transport riders from the lower Trail Hub D (pick-up) back up to the Summit Trailhead (drop-off). A diverse range of trail difficulties are catered for here to ensure there is a trail that suits each riders' respective skill level, while ensuring there are trails that challenge

### 5.6.20 Trail 20



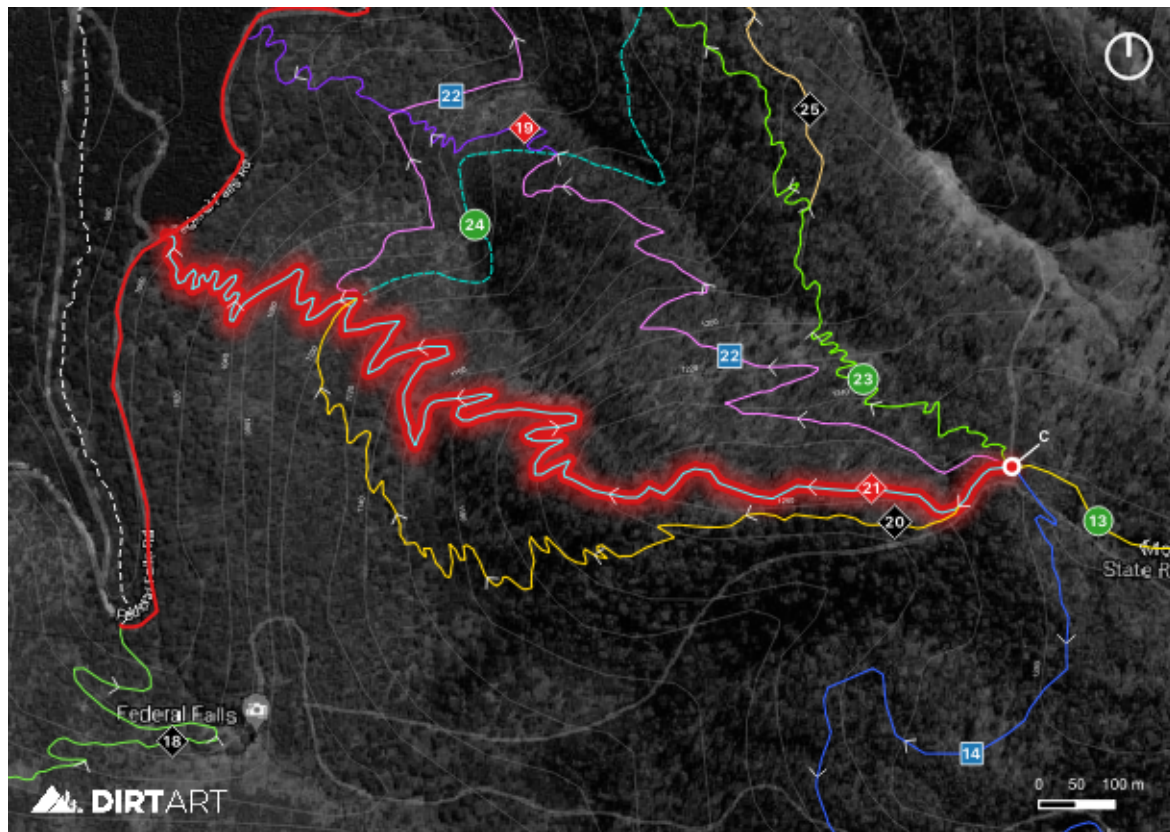
#### Key Statistics

Length	1991m
TDRS (IMBA Rating)	Black Diamond
Style	Technical
Format	Descent
Direction	Single Direction
Width	300-900mm
Land Tenure	NPWS SCA
Construction Methodology	Machine-Built
Environmental Sensitivities	RWL, EC, RO

#### Trail Concept Overview

Trail 20 is an advanced descent that starts at Trail Hub C and finishes at the lower trail junction with Trail 21 and 22. The trail is characterised by a steeper average trail alignment with flowing turns linking in natural trail features found within the landscape. Trail 20 features less rock and subsequently less technically demanding than the nearby T21 to the north. This trail is designed as part of a cluster of gravity-focused trails to the west of Mt Canobolas that utilise an uplift service to transport riders from the lower Trail Hub D (pick-up) back up to the Summit Trailhead (drop-off). A diverse range of trail difficulties are catered for here to ensure there is a trail that suits each riders' respective skill level, while ensuring there are trails that challenge

### 5.6.21 Trail 21



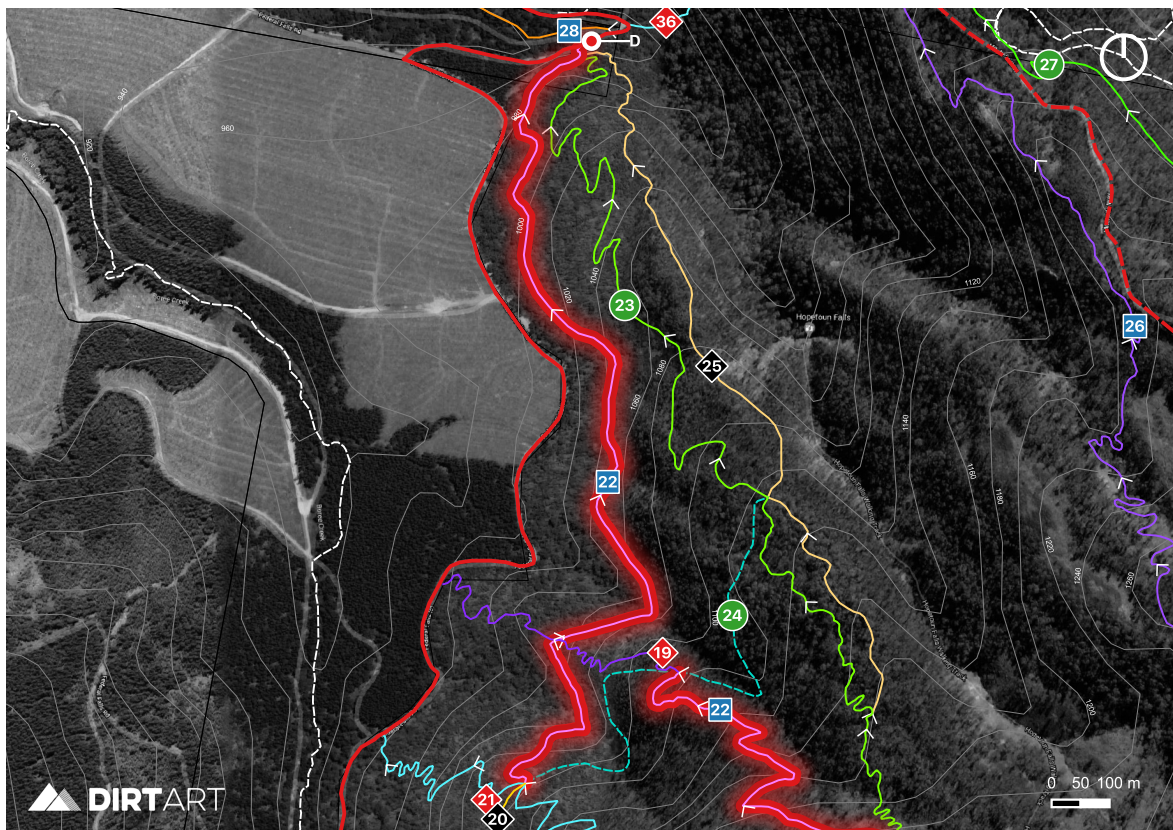
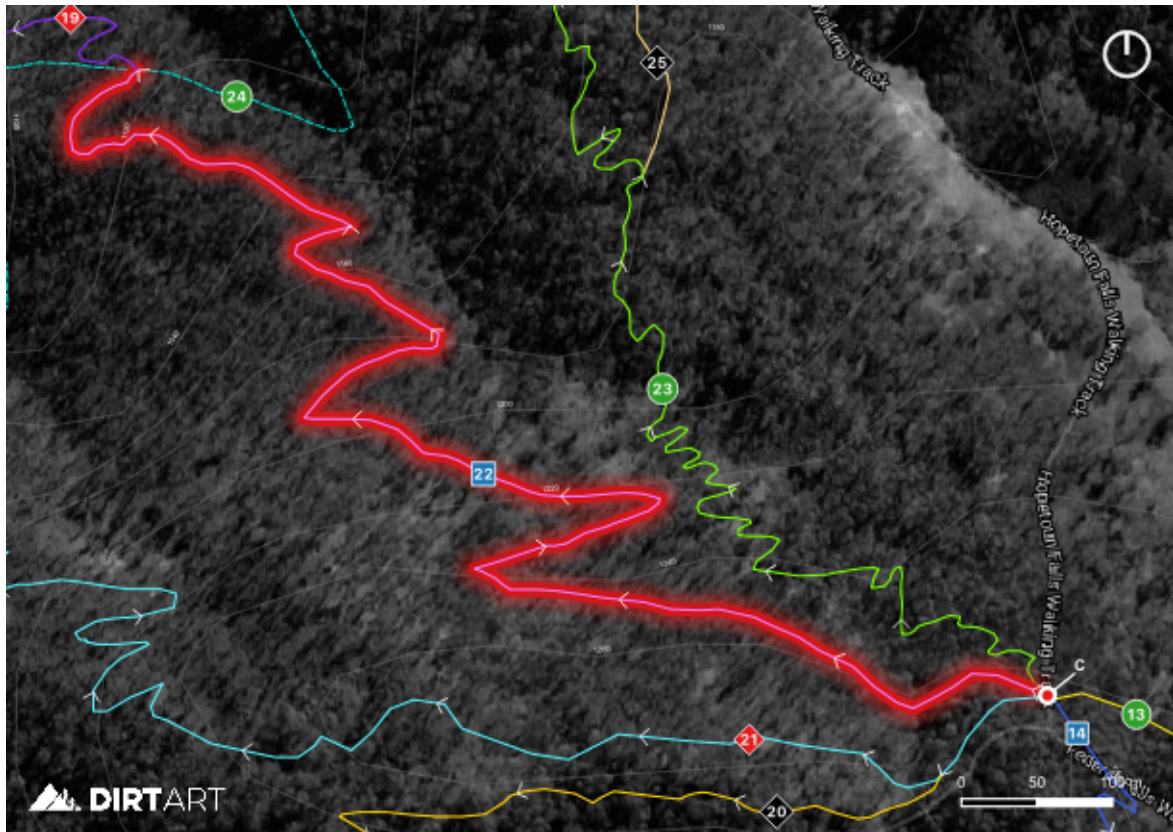
#### Key Statistics

Length	3004m
TDRS (IMBA Rating)	Double Black Diamond
Style	Technical
Format	Descent
Direction	Single Direction
Width	150-900mm
Land Tenure	NPWS SCA
Construction Methodology	Machine-Built
Environmental Sensitivities	RWL, EC, RO

#### Trail Concept Overview

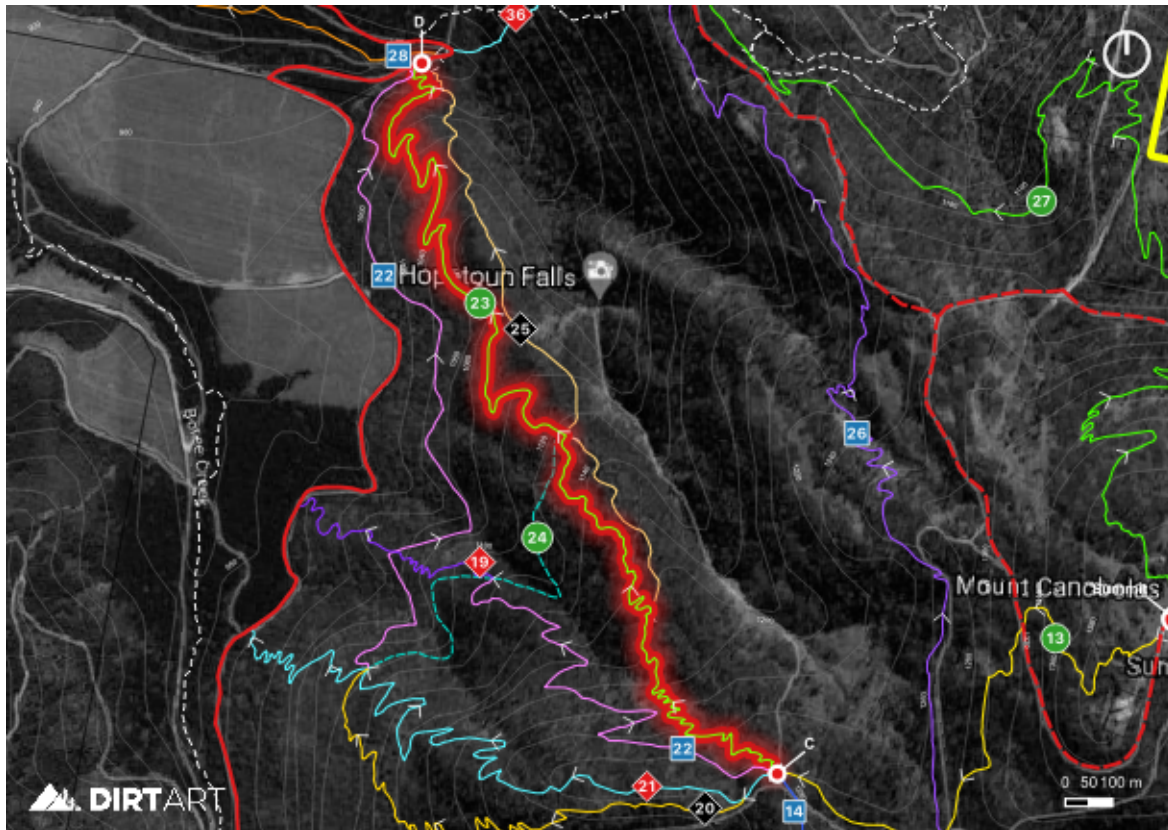
Trail 21 is an expert descent that starts Trail Hub C and finishes down on Federal Falls Road. The trail is characterised by the steep and rocky ridgeline, which is set to challenge the best riders. Graded as Double Black Diamond, this trail represents the upper end of the IMBA difficulty spectrum and caters for the highly experienced / competent enthusiast mountain biker. This trail can be linked into the lower half of Trail 22 to take riders to the proposed shuttle pick-up point. This trail is designed as part of a cluster of gravity-focused trails to the west of Mt Canobolas that utilise an uplift service to transport riders from the lower Trail Hub D (pick-up) back up to the Summit Trailhead (drop-off). A diverse range of trail difficulties are catered for here to ensure there is a trail that suits each riders' respective skill level.

5.6.22 Trail 22



<b>Key Statistics</b>	
Length	3757m
TDRS (IMBA Rating)	Blue Square
Style	Flow
Format	Descent
Direction	Single Direction
Width	600-900mm
Land Tenure	NPWS SCA
Construction Methodology	Machine-Built
Environmental Sensitivities	RWL, EC, WB, RO, RF, WF
<b>Trail Concept Overview</b>	
<p>Trail 22 is an intermediate descent that starts at Trail Hub C and utilises the southern half of the two-way Trail 24 midway down before finishing at Trail Hub D. The trail is designed to be fast and flowy, catering for beginner through intermediate riders. It will be a trail enjoyable at any skill level and takes in some of the most scenic areas in the SCA, including taking riders along the base of a stunning cliff line and small waterfall. Trail 22 is set to be an iconic feature trail in the Mt Canobolas network. This trail is designed as part of a cluster of gravity-focused trails to the west of Mt Canobolas that utilise an uplift service to transport riders from the lower Trail Hub D (pick-up) back up to the Summit Trailhead (drop-off). A diverse range of trail difficulties are catered for here to ensure there is a trail that suits each riders' respective skill level.</p>	

### 5.6.23 Trail 23



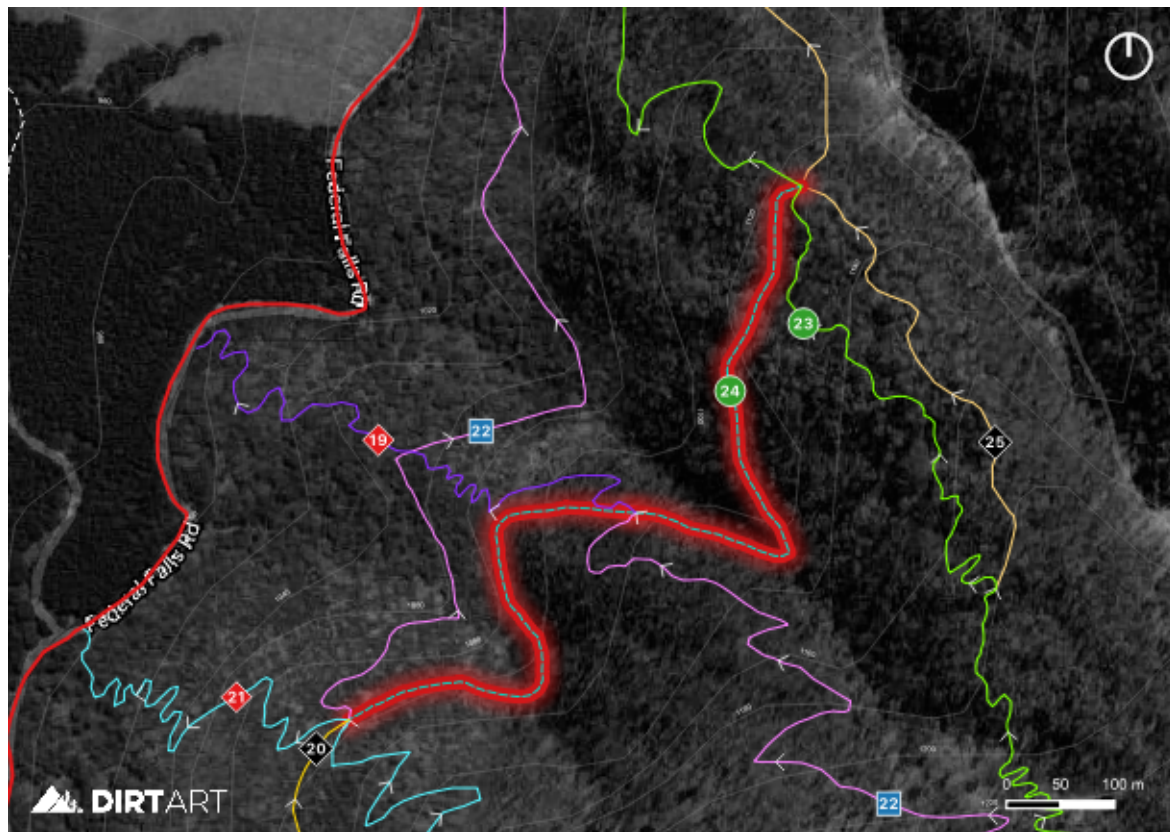
#### Key Statistics

Length	3590m
TDRS (IMBA Rating)	Green Circle
Style	Flow
Format	Descent
Direction	Single Direction
Width	1,200mm
Land Tenure	NPWS SCA
Construction Methodology	Machine-Built
Environmental Sensitivities	WB, WC, EC,

#### Trail Concept Overview

Trail 23 is a beginner descent that starts at Trail Hub C and finishes at Trail Hub D. The trail follows the northern ridgeline, meandering along mellow gradients to gradually take riders down to the proposed shuttle pick-up point at Trail Hub D. The trail is designed with less confident riders in mind and provides an enjoyable descending experience through some beautiful and scenic terrain. It can also be used to access the more difficult Trail 25, which starts part way down Trail 23. This trail is designed as part of a cluster of gravity-focused trails to the west of Mt Canobolas that utilise an uplift service to transport riders from the lower Trail Hub D (pick-up) back up to the Summit Trailhead (drop-off). A diverse range of trail difficulties are catered for here to ensure there is a trail that suits each riders' respective skill level.

### 5.6.24 Trail 24



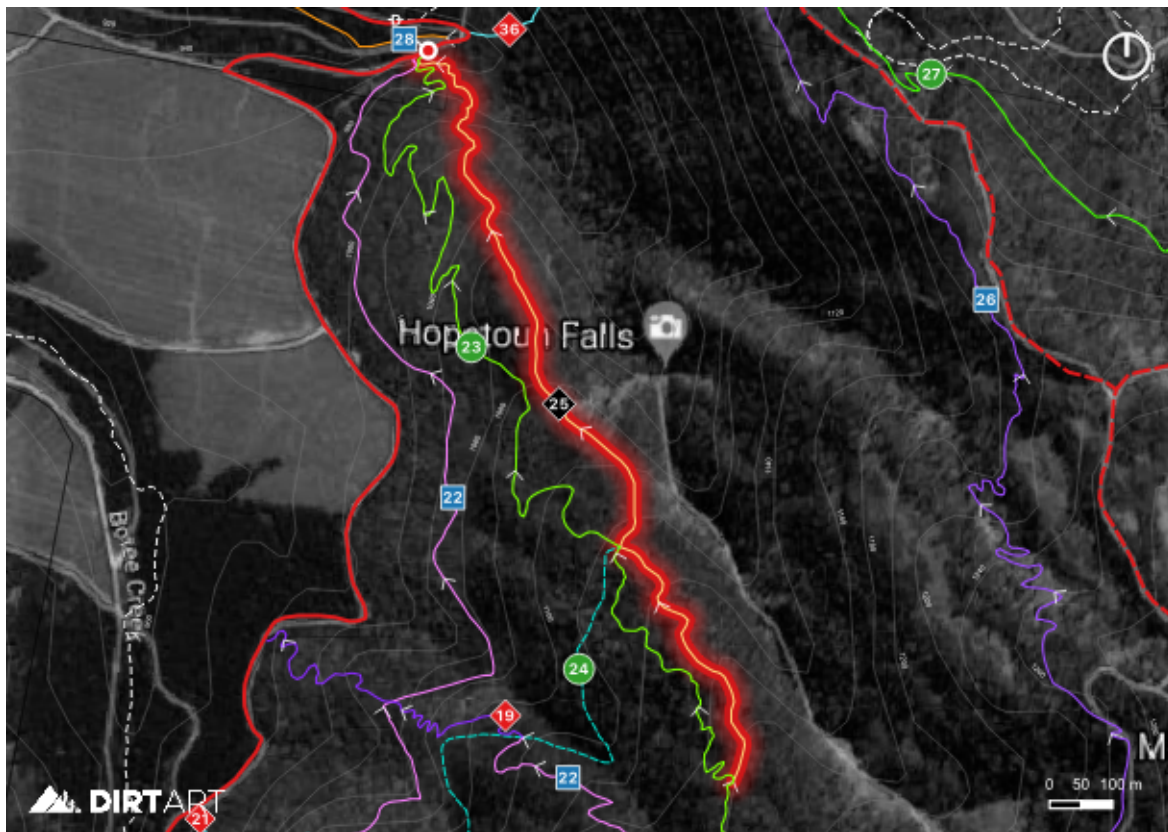
#### Key Statistics

Length	1229m
TDRS (IMBA Rating)	Green Circle
Style	Cross-Country
Format	Link
Direction	Two-Way
Width	1200mm
Land Tenure	NPWS SCA
Construction Methodology	Machine-Built
Environmental Sensitivities	RWL, EC, WC, RO

#### Trail Concept Overview

Trail 24 is a two-way beginner link trail that starts to the south at the trail junction between Trails 20/21 and finishes at the junction to the north between Trails 23 and 25. The bidirectional trail offers riders a range of trail configurations depending on their skill level by utilising the midline or midpoint of the western hillside’s available elevation. The trail creates a diversity of riding opportunities amongst the proposed trails in this area, allowing the flexibility for ridings to mix and match trails to their preference or taste. This trail is designed as part of a cluster of gravity-focused trails to the west of Mt Canobolas that utilise an uplift service to transport riders from the lower Trail Hub D (pick-up) back up to the Summit Trailhead (drop-off). A diverse range of trail difficulties are catered for here to ensure there is a trail that suits each riders’ respective skill level.

### 5.6.25 Trail 25



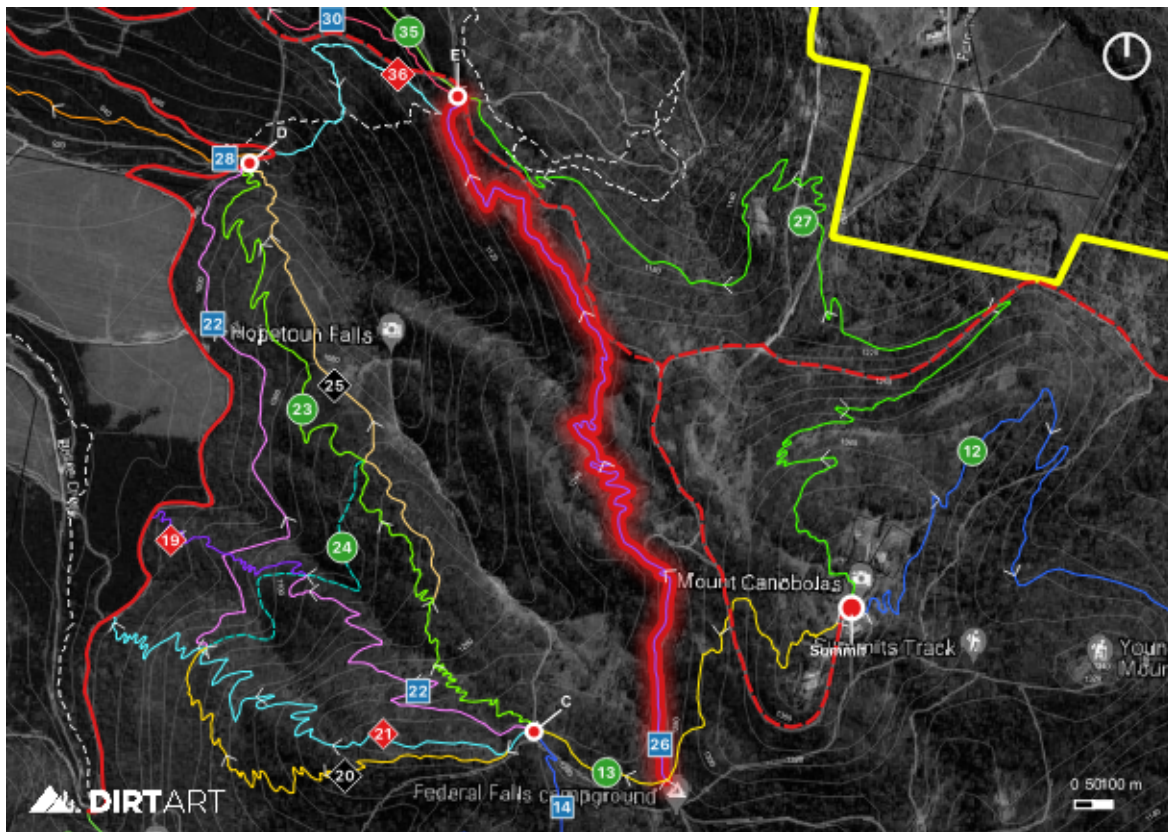
#### Key Statistics

Length	1736m
TDRS (IMBA Rating)	Black Diamond
Style	Technical
Format	Descent
Direction	Single Direction
Width	300-900mm
Land Tenure	NPWS SCA
Construction Methodology	Machine-Built
Environmental Sensitivities	EC, RO, RWL

#### Trail Concept Overview

Trail 25 is an advanced descent that starts part way down Trail 23 and finishes at Trail Hub D. The trail is characterised as a more challenging trail that follows the northern ridgeline before a steep finish brings riders to the proposed shuttle pick-up point at Trail Hub D. This trail is designed as part of a cluster of gravity-focused trails to the west of Mt Canobolas that utilize an uplift service to transport riders from the lower Trail Hub D (pick-up) back up to the Summit Trailhead (drop-off). A diverse range of trail difficulties are catered for here to ensure there is a trail that suits each riders' respective skill level.

## 5.6.26 Trail 26



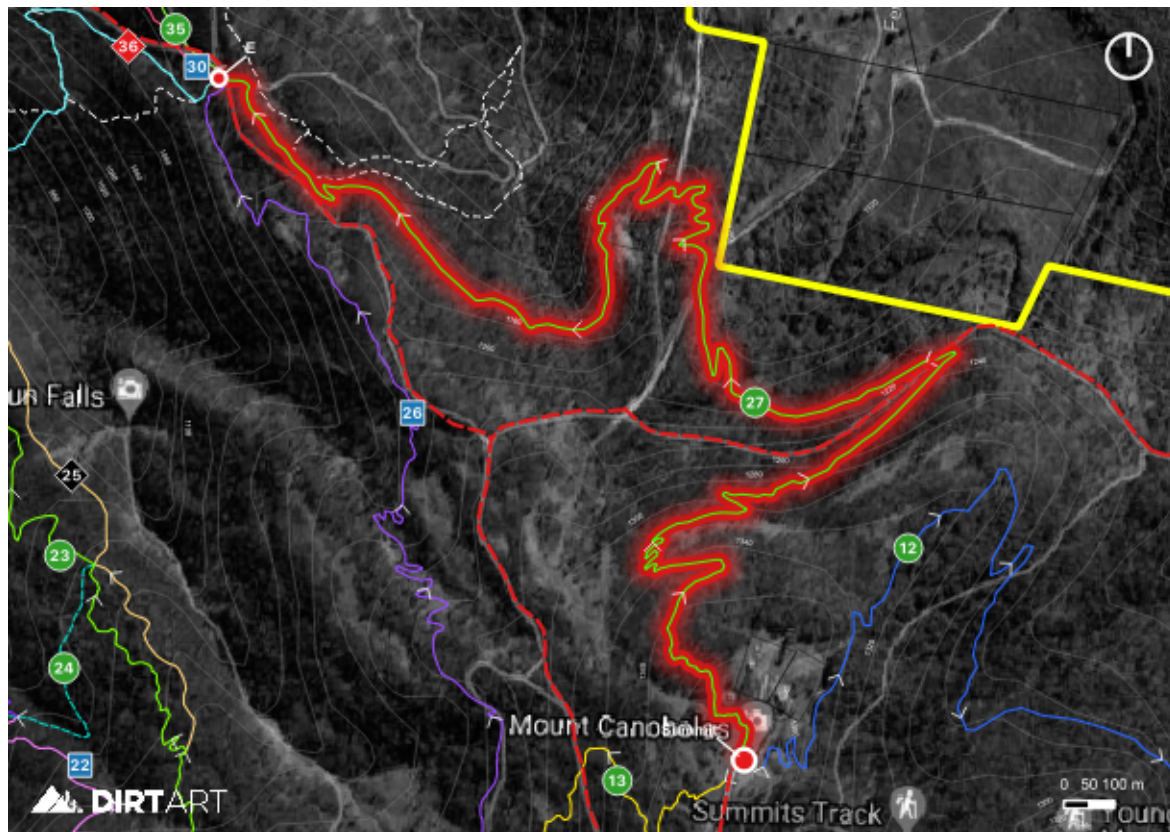
### Key Statistics

Length	3108m
TDRS (IMBA Rating)	Blue Square
Style	All-Mountain
Format	Descent
Direction	Single Direction
Width	600-900mm
Land Tenure	NPWS SCA
Construction Methodology	Machine-Built
Environmental Sensitivities	EC, RO, WC

### Trail Concept Overview

Trail 26 is an intermediate trail that starts where Trail 13 crosses Towac Way and finishes at Trail Hub E. The trail begins with predominately contouring trail shadowing the road, before a long weaving descent takes riders to a gully crossing. A short climb takes riders up close to Mitchells Way before utilising parts of an existing descending trail down to Trail Hub E. The all-mountain trail style is a mixture of undulating trail, short climbs, and longer descents. Used in conjunction with Trail 13 from the summit, the trail provides a more challenging alternative to Trail 27 to access the northern cluster of trails in Forestry land.

## 5.6.27 Trail 27



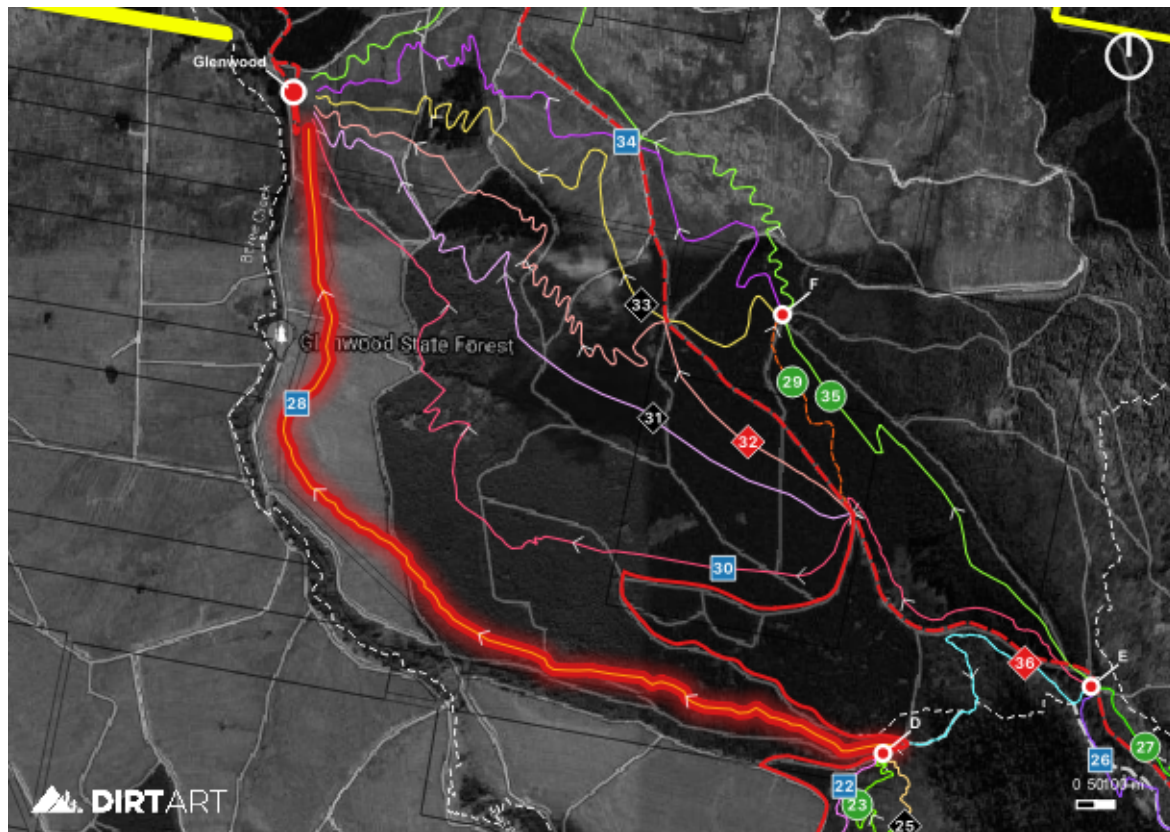
### Key Statistics

Length	5636m
TDRS (IMBA Rating)	Green Circle
Style	Flow
Format	Descent
Direction	Single Direction
Width	1,200mm
Land Tenure	NPWS SCA / Forestry Land
Construction Methodology	Machine-Built
Environmental Sensitivities	RO

### Trail Concept Overview

Trail 27 is a beginner descent that starts at the summit of Mt Canobolas and finishes at Trail Hub E. The trail weaves its way down the northern face of the mountain giving riders spectacular views towards Nashdale and beyond. After crossing Mount Canobolas Road, the trail wraps around to Old Canobolas Road before hopping across the road and traverse along the edge of a cliff line. The proposed alignment has carefully managed to avoid all known constraints while maintaining a generally descending experience catered for beginner riders.

## 5.6.28 Trail 28



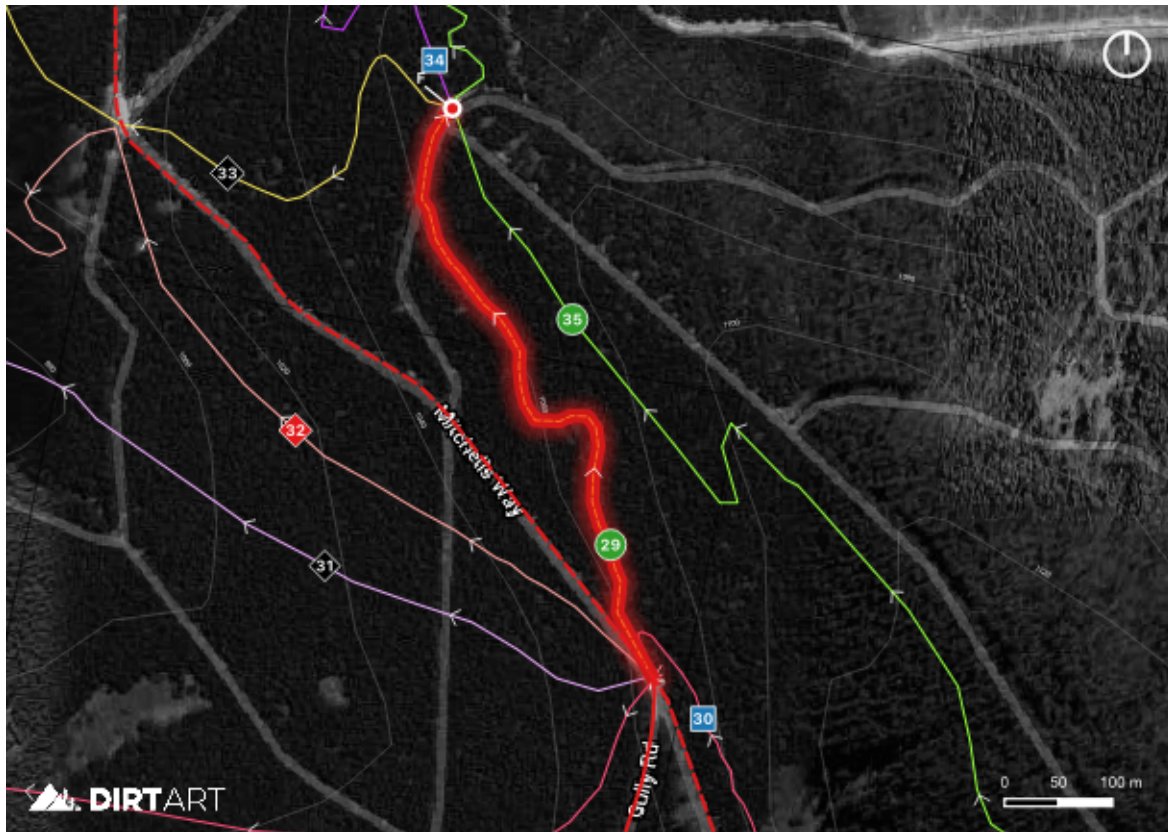
### Key Statistics

Length	3453m
TDRS (IMBA Rating)	Blue Square
Style	All-Mountain
Format	Descent
Direction	Single Direction
Width	600-900mm
Land Tenure	Forestry Land
Construction Methodology	Machine-Built
Environmental Sensitivities	N/A

### Trail Concept Overview

Trail 28 is an intermediate descent that starts at Trail Hub D and finishes at the Glenwood Trailhead. The first section of the trail utilizes an old existing access track before a short climb brings riders along the new trail alignment. The trail generally descends from this point with some fun and undulating trail mixed in with minimal climbing at points around gully crossings. The trail has been designed to cater for beginner to intermediate riders.

### 5.6.29 Trail 29



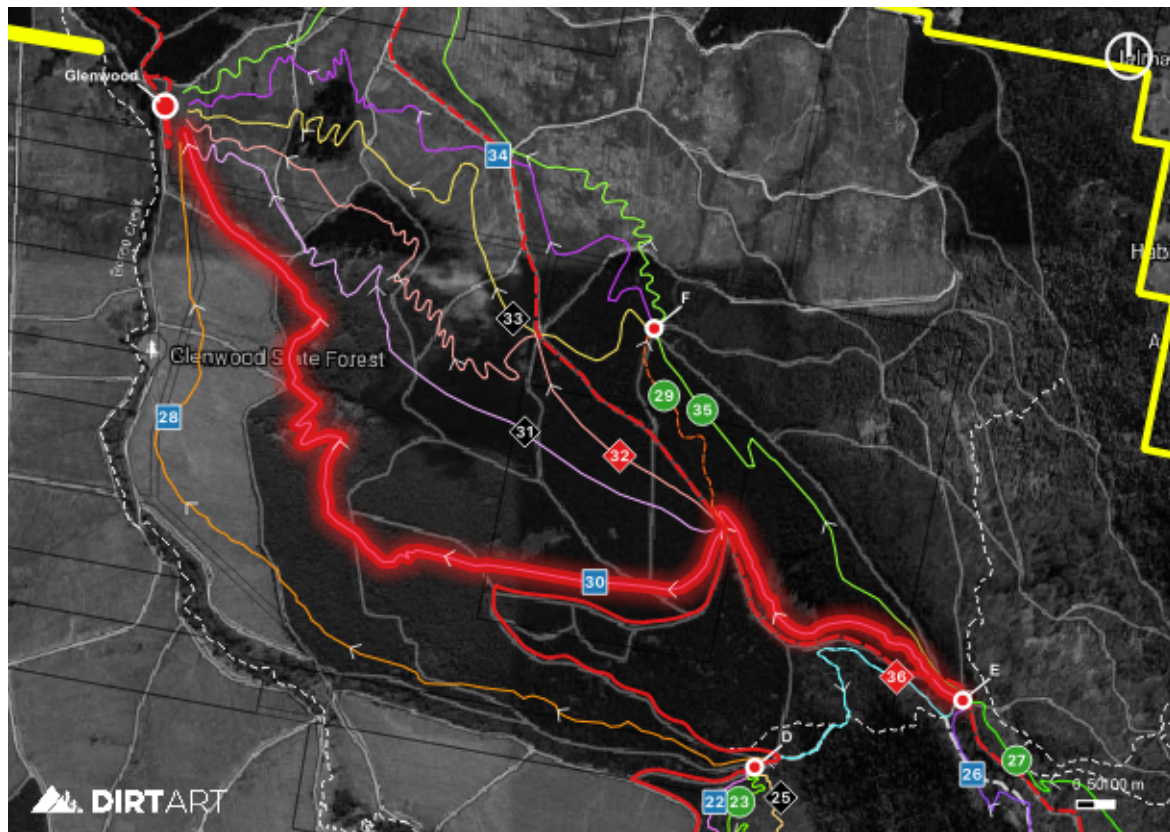
#### Key Statistics

Length	730m
TDRS (IMBA Rating)	Green Circle
Style	Cross-Country
Format	Link
Direction	Dual Direction
Width	1200mm
Land Tenure	Forestry Land
Construction Methodology	Machine-Built
Environmental Sensitivities	N/A

#### Trail Concept Overview

Trail 29 is a beginner climbing trail that starts at the junction between Mitchells Way and Trails 30-32 and finishes at Trail Hub F. It is designed to provide an ascending link for those riders climbing out along the fire trail from Trail Hub D and wanting to access the series of freeride orientated trails to the north.

### 5.6.30 Trail 30



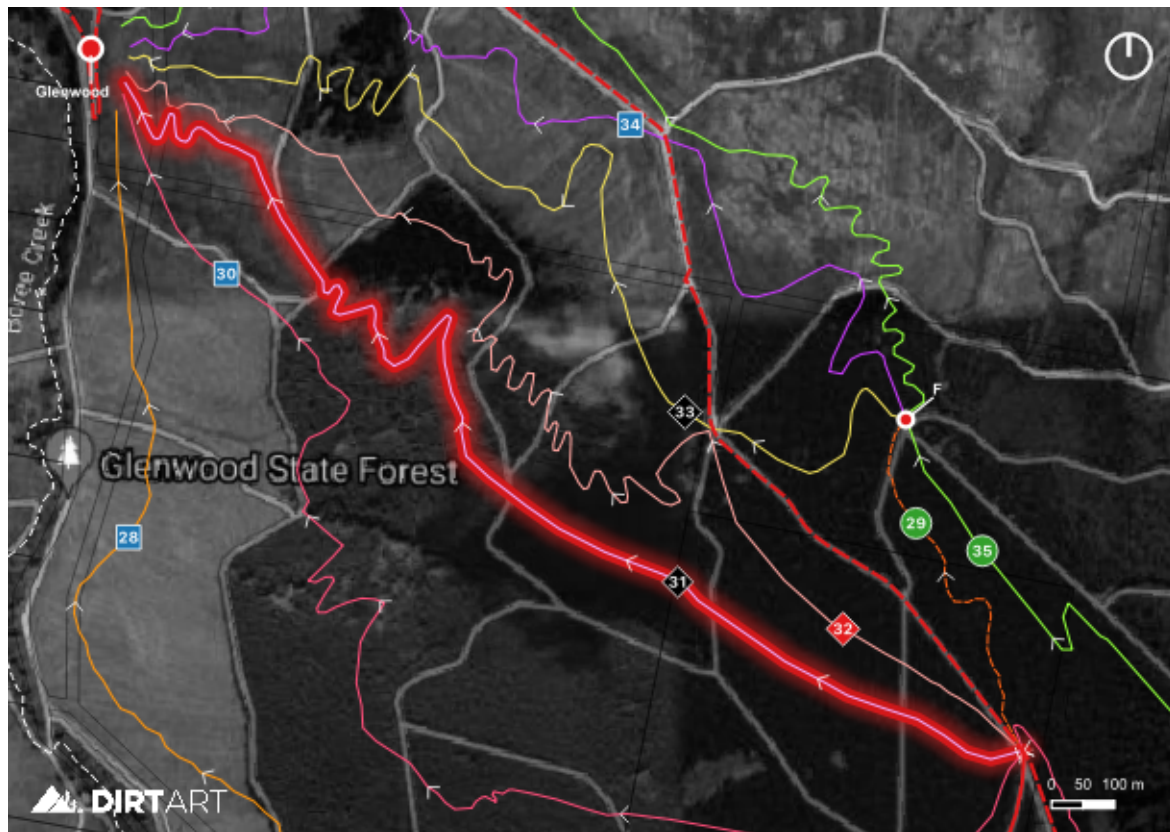
#### Key Statistics

Length	4450m
TDRS (IMBA Rating)	Blue Square
Style	Freeride / Jumps
Format	Descent
Direction	Single Direction
Width	0.9-3m
Land Tenure	Forestry Land
Construction Methodology	Machine-Built
Environmental Sensitivities	N/A

#### Trail Concept Overview

Trail 30 is an intermediate descent that starts at Trail Hub E and finishes at the Glenwood Trailhead. The trail is a freeride trail characterised by bike park style features such as large berms, rollers, and tabletop jumps. It is designed to introduce beginner to intermediate riders to jumping with a series of safe and progressive tabletop jumps fine-tuned for the natural trail speed and adequately spaced to ensure less confident riders have sufficient time to recover between each successive feature. The intermediate jumps trail will likely be one of the most popular trails in the network due to its fun and highly repeatable nature. For more advanced riders, Trail 30 will be a good warm-up for the more difficult freeride trails in this zone.

### 5.6.31 Trail 31



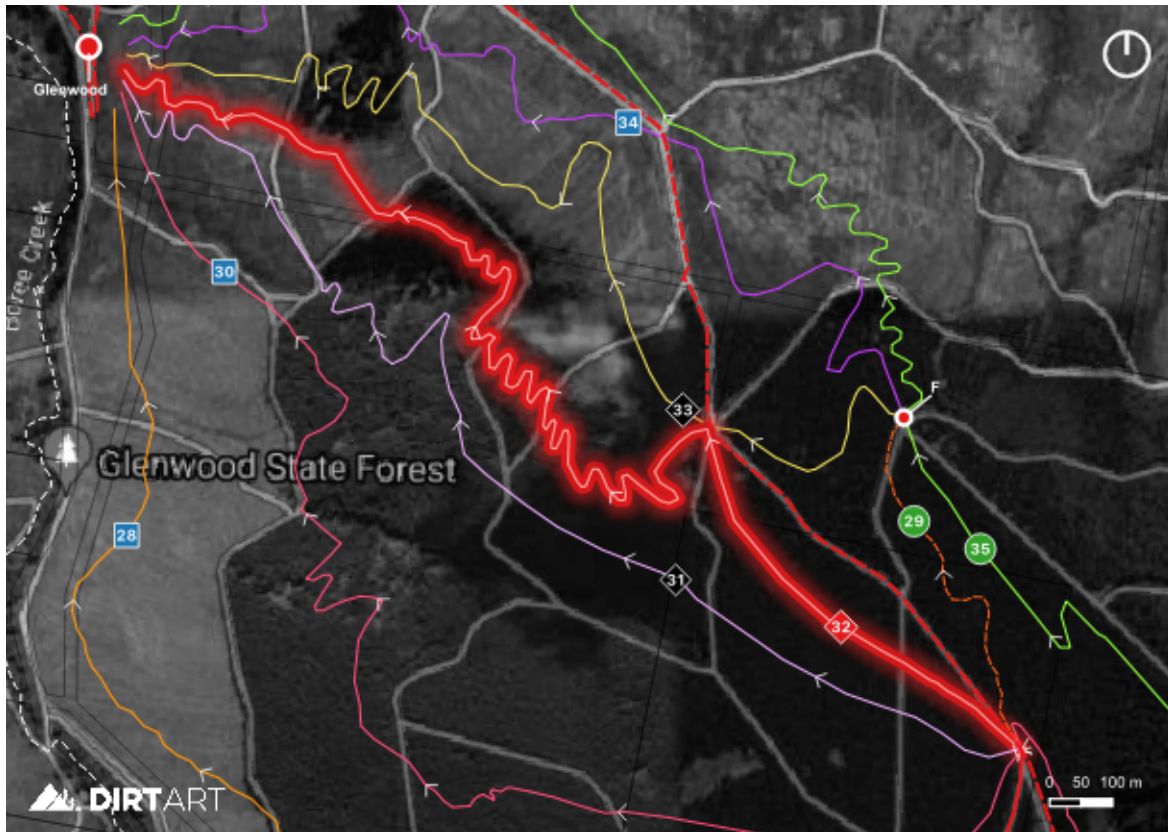
#### Key Statistics

Length	2699m
TDRS (IMBA Rating)	Black Diamond
Style	Freeride / Jumps
Format	Descent
Direction	Single Direction
Width	2-3m
Land Tenure	Forestry Land
Construction Methodology	Machine-Built
Environmental Sensitivities	N/A

#### Trail Concept Overview

Trail 31 is an advanced descent that starts at the junction between Mitchells Way and Trails 30/31 and finishes at Glenwood Trailhead. The trail is a freeride trail characterized by bike park style features such as large berms, rollers, and tabletop jumps with pronounced case pads or knuckles. It is designed to cater for more experienced riders with advanced jumping skills. The jump features will be slightly larger in size than those found on Trail 33 as well as being higher in frequency. The introduction of slight off-axis jump lips (shark fin style) will be present throughout the trail, albeit optional to riders depending on their line choice at the take-off. Riders not wishing to hit the off-axis section of the respective jump lips, will still be able to take-off from the centerline of these jumps as a standard horizontal jump lip.

### 5.6.32 Trail 32



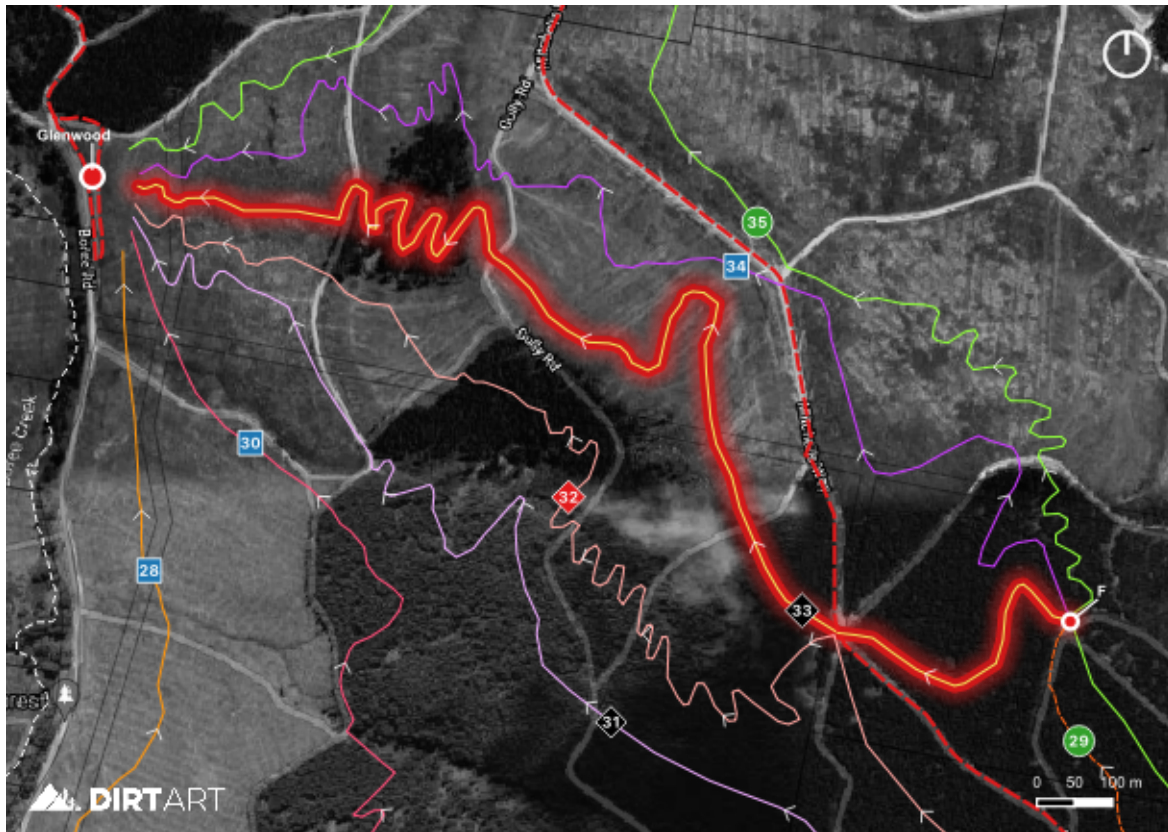
#### Key Statistics

Length	3313m
TDRS (IMBA Rating)	Double Black Diamond
Style	Freeride / Jumps
Format	Descent
Direction	Single Direction
Width	2-3m
Land Tenure	Forestry Land
Construction Methodology	Machine-Built
Environmental Sensitivities	WC

#### Trail Concept Overview

Trail 32 is an expert descent that starts at the junction between Mitchells Way and Trails 30/31 and finishes at Glenwood Trailhead. The trail is a freeride trail characterized by bike park style features such as large berms, rollers, and mandatory gap jump and drop features. It is designed to cater for the most experienced and competent riders only. All mandatory jump and drop features will have an optional safety line to bypass the feature or scope out the feature on their first run down the trail. Clear line of sight and adequate room will be provided to allow riders to come to a safe stop should they wish to not proceed with the feature. The technical trail features will range in size, shape, and style to create an interesting and highly engaging freeride trail for enthusiasts.

### 5.6.33 Trail 33



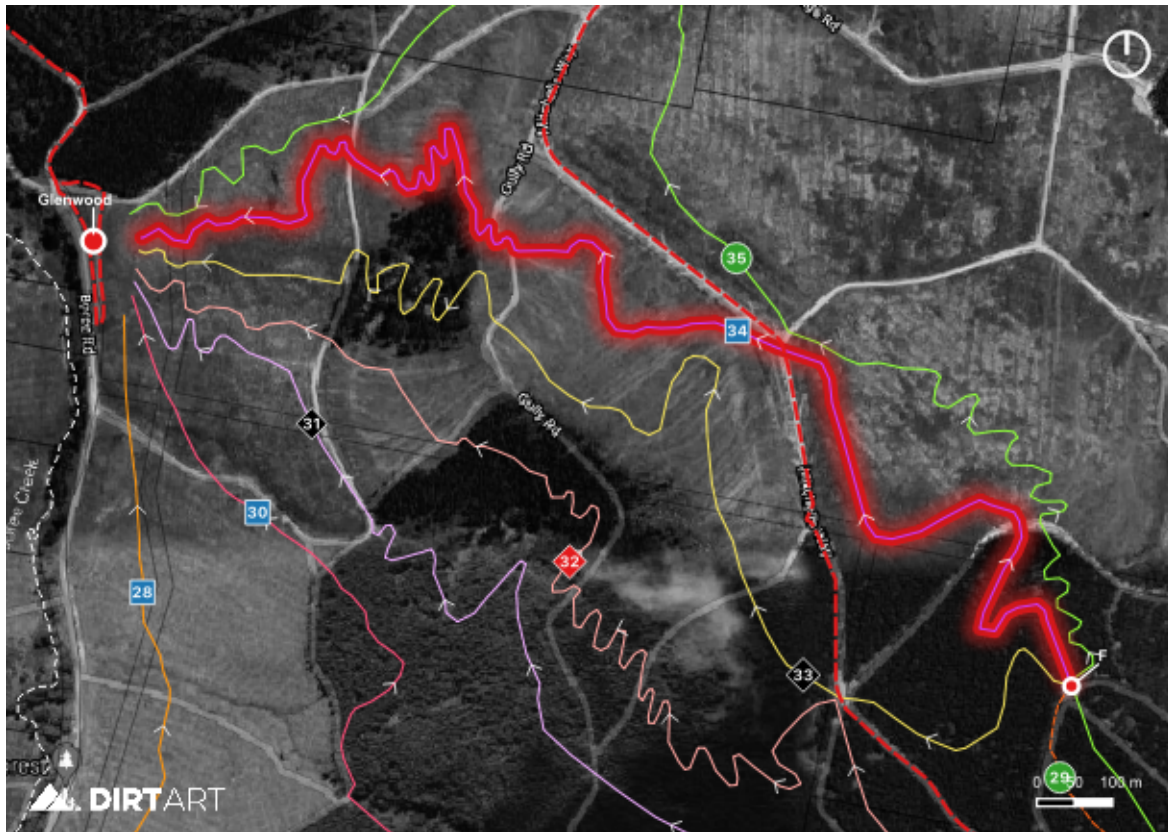
#### Key Statistics

Length	2649m
TDRS (IMBA Rating)	Black Diamond
Style	Freeride / Jumps
Format	Descent
Direction	Single Direction
Width	2-3m
Land Tenure	Forestry Land
Construction Methodology	Machine-Built
Environmental Sensitivities	N/A

#### Trail Concept Overview

Trail 33 is an advanced descent that starts at Trail Hub F and finishes at Glenwood Trailhead. The trail is a freeride trail characterised by bike park style features such as large berms, rollers, and tabletop jumps. It is designed to cater for more experienced riders with intermediate to advanced jumping skills. The jump features will represent the next level in terms of progression from the nearby Trail 34 with slightly larger tabletop jumps present throughout the trail. It will teach riders to be comfortable with longer time in the air as well as faster trail speeds. The features will be designed to cater for the natural trail speed and require minimal input from the rider to safely make it to the landing.

### 5.6.34 Trail 34



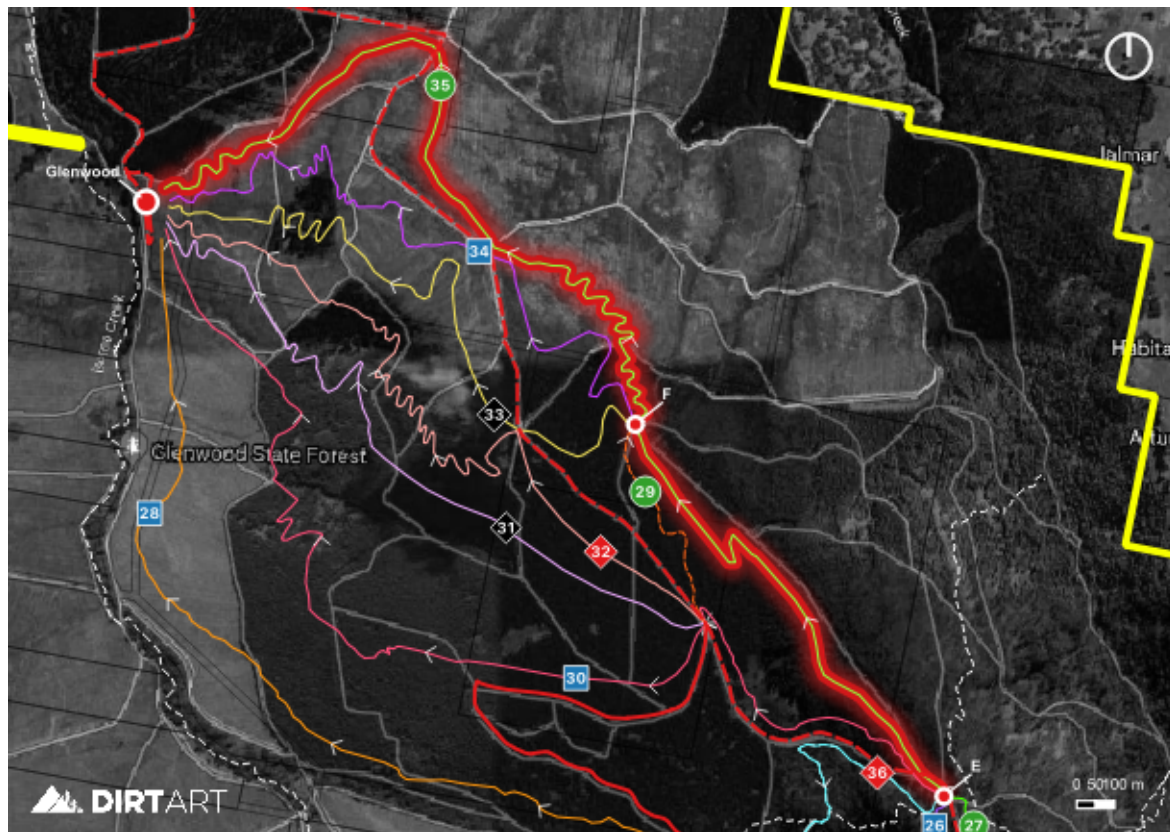
#### Key Statistics

Length	2734m
TDRS (IMBA Rating)	Blue Square
Style	Freeride / Jumps
Format	Descent
Direction	Single Direction
Width	2-3m
Land Tenure	Forestry Land
Construction Methodology	Machine-Built
Environmental Sensitivities	RWL, WA

#### Trail Concept Overview

Trail 24 is an intermediate descent that starts at Trail Hub F and finishes at Glenwood Trailhead. The trail is a freeride trail characterised by bike park style features such as large berms, rollers, and tabletop jumps. It is designed as the main introductory trail to riders learning to jump with approachable tabletop jumps that are spaced generously throughout the trail alignment, allowing individuals ample time to prepare and set themselves up for each successive feature. The trail is split into an upper and lower section by Mitchells Way, which allows riders to stop, rest, and regroup prior to descending into the lower set of jumps. The features will be designed to cater for the natural trail speed and require minimal input from the rider to safely make it to the landing.

### 5.6.35 Trail 35



#### Key Statistics

Length	4831m
TDRS (IMBA Rating)	Green Circle
Style	Flow
Format	Descent
Direction	Single Direction
Width	2-3m
Land Tenure	Forestry Land
Construction Methodology	Machine-Built
Environmental Sensitivities	RO, WA

#### Trail Concept Overview

Trail 35 is a beginner descent that starts at Trail Hub E and finishes at Glenwood Trailhead. The trail leads on from Trail 26/27 in the SCA and provides access across to the northern freeride trails in Forestry Land. It takes a gradually descending alignment along the prominent ridgeline before a series of large sweeping berms take riders down to the lower road crossing at Mitchells Way. The trail will introduce beginner riders to the bike park style of trail with large machine-built berms and rollers that teach riders invaluable cornering skills, pressure control, and basic body positioning on the bike. These attributes are fundamental to allowing riders to safely progress to the myriad of freeride/jump trails in this area.

### 5.6.36 Trail 36



#### Key Statistics

Length	1130m
TDRS (IMBA Rating)	Double Black Diamond
Style	Technical
Format	Descent
Direction	Single Direction
Width	150-300mm
Land Tenure	Forestry Land
Construction Methodology	Hand-built
Environmental Sensitivities	N/A

#### Trail Concept Overview

Trail 36 is an expert descent that starts at Trail Hub E and finishes at Trail Hub D. The trail is an informal trail that already exists and has been included in this proposal to be formalised as part of the greater network proposed. Aptly named as Rocky Road, it is characterised as a steep and challenging trail that follows a narrow hand-cut bench across some rocky terrain. The trail is proposed to undergo minor upgrade works to bring the trail up to industry standards. It is otherwise an exceptional trail that reflects the local style and technicality that can be naturally found from within the Mt Canobolas landscape.

## 6 Supporting Infrastructure

### 6.1 Overview

The Mount Canobolas Mountain Bike Trail Project is a significant adventure tourism development set to attract visitors from afar to experience the diverse trail offerings proposed in the area. For the trail network to be successful, several key elements are considered to be essential in order for the trails to function safely and efficiently. As the proposed trail network has a strong focus on uplift-assisted riding, two primary trailheads or formal pick-up locations have been identified to service the various trail offerings, one located to the east of mountain near the Tea House and another to the north-west in Glenwood State Forest. These two trailheads serve as the major entry nodes into the proposed trail network and the main areas where trail signage, carparking, and relating amenities will be required.

Three trailhead concept plans have been put forward by *Dirt Art* as notional placeholders for future detailed design and development. These do not represent finalised designs and should be viewed as high-level concepts showing the key elements that will be required in these specific locations to service the trails network proposed. For example, areas designed to accommodate trail signage, trailheads, carparking, amenities, and shuttle pick-up/drop-off points. More comprehensive facilities such as base buildings, cafes, or toilet blocks would be seen as complementary to the trail development and seen to enhance the overall user/visitor experience. However, they are not critical to the functioning of the proposed trail network itself and would need to be developed in consultation with the respective land managers.

### 6.2 Primary Trailheads

There are three major trailheads proposed to function as the primary entry nodes into the trail network. These are listed below:

1. Tea House
2. Summit (Mount Canobolas)
3. Glenwood

These trailheads will serve as the main points for pick-up and drop-off for various shuttle uplift services whether they be private or commercial operators. All of the proposed trailheads will have 2WD vehicle access

#### 6.2.1 Proposed Infrastructure

The Primary Trailheads will have the following infrastructure present:

- Signage:
  - General Information

- Site, location, history, and climate
    - Rider safety, code of conduct, trail etiquette
    - Emergency information
  - Trail Map
    - 'You are here' location marker to allow riders to easily locate themselves within the trail network
    - Trail map clearly depicting the various trails and their respective difficulties
    - Primary trailheads clearly defined
  - Trailhead Markers
    - Trail Name
    - Trail Difficulty (IMBA TDRS Rating)
    - Trail Length
- Carparking
  - Carparking is proposed at the Tea House and Glenwood trailheads
  - No additional carparking is proposed at the Summit other than what already exists and is planned to be built by NSW NPWS
- Amenities
  - Toilets
  - Bicycle racks
  - Bicycle repair station
    - Basic tools
    - Pump
    - Work stand
  - Seating
  - Shelter(s)
  - Drinking water
- Uplift Service
  - Designated drop-off / pick-up point that is clearly defined with appropriate signage and physical markers such as bollards or ground markings such as line markings (where applicable)
  - Loading/unloading bay that allows riders to safely load/unload bicycles away from moving vehicular traffic
  - One-way loop to allow shuttle vehicles with/without trailers to easily access the drop-off / pick-up bays
    - No reversing vehicles
  - Potential to allocate private and commercial zones to reduce any potential traffic conflicts
    - Commercial operators will generally use larger capacity vehicles and trailers, which will require more space
    - Private vehicles will typically use hitch-mounted bicycle racks which take 4-6 bikes and require less space than a commercial bus/trailer configuration

# Mount Canobolas MTB Project

## TRAILHEAD CONCEPT: TEA HOUSE

21.06.21



Proposed Infrastructure

- Existing
- Amenities
- Landscaped Area
- Pump Track
- Shuttle Bay (Commercal)
- Shuttle Bay (Private)
- Carparking

Proposed Trails

- Trailhead
- Trail Hub
- Shuttle Road
- Road Link
- C1 - Green Circle
- C5 - Blue Square
- Study Area

Base Layers

- Road
- Existing Track
- Lot

## 6.2.2 Tea House Trailhead

- Located to the eastern side of the trail network on the corner of Mount Canobolas Road and Lake Canobolas Road
- Signage:
  - This site is to incorporate the entire signage suite relating to a primary trailhead
  - Additional information such as park closures or fire bans to be displayed here
  - Any trail branding to be integrated into this facility
- Carparking:
  - Existing carparking available onsite
    - Large carpark accessed via Lake Canobolas Road
    - Small carpark accessed via Mount Canobolas Road
      - Potential to turn this into the primary shuttle pick-up area for both private and commercial vehicles
  - Primary area for visitor parking
    - Visitors park and leave their car here for the day to utilize a private or commercial shuttle uplift service
    - Services a cluster of beginner-friendly cross-country trails that are pedal accessible from this trailhead – i.e., Trails 1-7
- Amenities:
  - Utilise existing onsite facilities such as toilet, shelter, and picnic area
  - Potential to upgrade facilities to cater for greater visitor numbers such as the existing toilet block and the provision of more shelter/seating
  - Develop bicycle-specific infrastructure such as storage racks and basic repair station
- Uplift Service
  - Primary shuttle pick-up point for the trail network
  - Potential to utilise the small carpark and informal turning bay on Mount Canobolas Road (opposite the Tea House) as the shuttle pick-up point
  - One-way pick-up loop to be created and formalised

# Mount Canobolas MTB Project

## TRAILHEAD CONCEPT: SUMMIT

21.06.21



**Proposed Infrastructure**

- Existing
- Amenities
- Landscaped Area
- Pump Track
- Shuttle Bay (Commerical)
- Shuttle Bay (Private)
- Carparking

**Proposed Trails**

- Trailhead
- Trail Hub
- Shuttle Road
- Road Link
- C12 - Green Circle
- C13 - Green Circle
- C27 - Green Circle
- Study Area

**Base Layers**

- Road
- Existing Track
- Lot

### 6.2.3 Summit Trailhead

- Located in the geographical centre and highpoint of the trail network
- Signage:
  - This site is to incorporate the entire signage suite relating to a primary trailhead
  - Any trail branding to be integrated into this facility in conjunction with NPWS signage
- Carparking:
  - Existing carparking available onsite
    - Medium carpark
    - Large carpark development planned by NPWS on the western edge of the existing summit area
  - No additional carparking proposed by the trail concept plan
    - The Summit Trailhead is not identified as a place for riders to park their vehicle
    - All proposed trails depart the summit as descents
    - No ascending trails proposed to the summit
    - It is proposed riders are dropped off at the summit by private or commercial vehicles
- Amenities:
  - Utilise existing onsite facilities such as toilet and lookouts
  - Potential to upgrade facilities to cater for greater visitor numbers such as the existing toilet block and the provision of visitor shelter/seating
  - Develop bicycle-specific infrastructure such as storage racks and basic repair station at the trailhead
- Uplift Service
  - Primary shuttle drop-off point for the trail network
  - Potential to utilise eastern side of the summit area as the designated shuttle drop-off area
  - One-way drop-off loop to be created and formalised

# Mount Canobolas MTB Project

## TRAILHEAD CONCEPT: GLENWOOD

21.06.21



### Proposed Infrastructure

- Existing
- Amenities
- Landscaped Area
- Pump Track
- Shuttle Bay (Commerical)
- Shuttle Bay (Private)
- Carparking

### Proposed Trails

- Trailhead
- Shuttle Road
- C28 - Blue Square
- C30 - Blue Square
- C31 - Black Diamond
- C32 - Dbl Black Diamond
- C33 - Black Diamond
- C34 - Blue Square
- C35 - Green Circle
- Study Area

### Base Layers

- Road
- Existing Track
- Lot

#### 6.2.4 Glenwood Trailhead

- Located to the north-western side of the trail network on Boree Road
- Signage:
  - This site is to incorporate the entire signage suite relating to a primary trailhead
  - Additional information such as park closures or fire bans to be displayed here
  - Any trail branding to be integrated into this facility
- Carparking:
  - No carparking available at this particular site other than the existing car park at the northern end of Boree Road for the Galinbundinya Trail
  - Creation of a new carpark here to allow visitors to leave their car here for the day to utilise a private or commercial shuttle uplift service
- Amenities:
  - Utilise existing onsite facilities such as toilet, shelter, and picnic area
  - Potential to upgrade facilities to cater for greater visitor numbers such as the existing toilet block and the provision of more shelter/seating
  - Develop bicycle-specific infrastructure such as storage racks and basic repair station
- Uplift Service:
  - Primary shuttle pick-up point for the trail network
  - Potential to utilise the small carpark and informal turning bay on Mount Canobolas Road (opposite the Tea House) as the shuttle pick-up point
  - One-way pick-up loop to be created and formalised

## 6.3 Trail Hubs

There are five (5) Trail Hubs proposed in the network, which signify major trail intersections or junctions. The respective trails have been clustered together at these strategic nodes to maximise the available trail options for riders of varying ability, but also to ensure the trail network is easily navigable and functional. The Trail Hubs will generally be located in relatively flat and naturally clear areas with good sightlines. They form a natural place for riders to re-group or gather with other riders while also creating a diversity in riding options by allowing individuals to pick and choose between a range of trails.

### 6.3.1 Proposed Infrastructure

The Trail Hubs will have the following infrastructure present:

- Trail Map
  - 'You are here' location marker to allow riders to easily locate themselves within the trail network
  - Trail map clearly depicting the various trails and their respective difficulties
  - Primary trailheads clearly defined
- Trailhead Markers
  - Trail Name
  - Trail Difficulty (IMBA TDRS Rating)
  - Trail Length

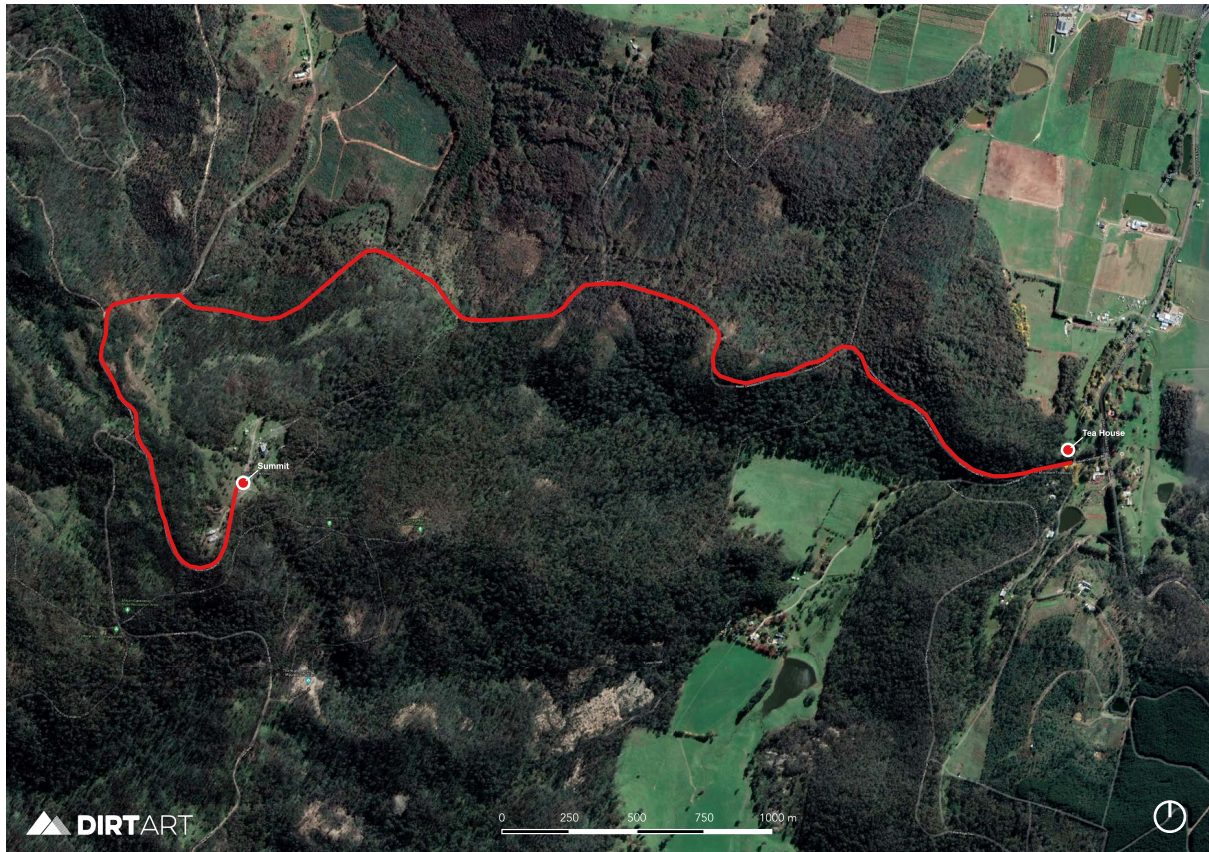
## 6.4 Shuttle Roads / Routes

There are two shuttle routes proposed that utilise existing sealed and unsealed roads to service a drop-off at the summit of Mount Canobolas. The summit acts as the primary drop-off point for the entire trail network given its location at the natural highpoint and provides the maximum vertical elevation/descent for riders to the respective lower trailhead pick-up points. For the proposed mountain bike network, the summit is proposed as a drop-off point only with no intention of shuttle pick-ups or car parking for the purposes of riding the trails.

The two proposed shuttle routes are defined below:

1. Tea House Trailhead to Summit
2. Glenwood Trailhead to Summit

## 6.4.1 Tea House Trailhead to Summit



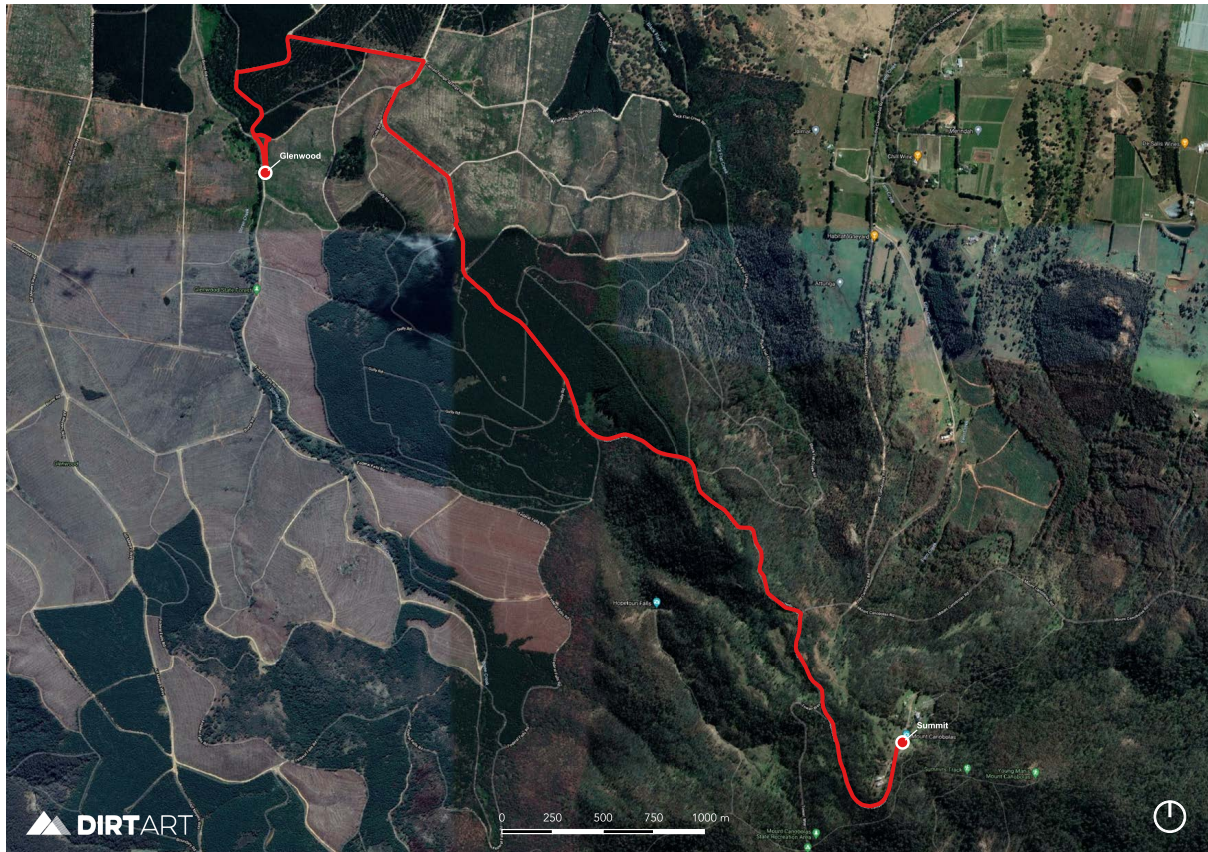
### 6.4.1.1 Shuttle Route Summary:

- Total Distance (One-Way): 5.8km
- Approximate Travel Time (One-Way): 9-minutes
- Follows Mount Canobolas Road to the summit
- Entire road is sealed bitumen
- Existing sections of the road are considered narrow for two-way traffic, especially for commercial shuttle vehicles with bicycle trailers in-tow

### 6.4.1.2 Potential Infrastructure Upgrade(s):

- Consider road widening at strategic points or install pullover bays with UHF callout points for commercial shuttle operators
- Potential to investigate roadside mirrors or similar devices in tighter sections of the existing Mount Canobolas Road

## 6.4.2 Glenwood Trailhead to Summit



### 6.4.2.1 Shuttle Route Summary:

- Total Distance: 6.8km
- Approximate Travel Time (One-Way): 14-minutes
- Departs Glenwood Trailhead from Boree Road before utilising a series of unsealed Forestry tracks to connect onto Mitchells Way
- All tracks/roads between Boree Road to Mount Canobolas Road are unsealed
- Good sightlines at junction between Mitchells Way and Mount Canobolas Road

### 6.4.2.2 Potential Infrastructure Upgrade(s):

- General project budget put aside to allow for ongoing maintenance to unsealed Forestry roads/tracks that form the primary shuttle route to the summit
- Consider road widening at strategic points or install pullover bays with UHF callout points for commercial shuttle operators
- Dust suppression measures may be required along the unsealed sections of the road during peak periods, especially in the drier months of the year
  - Dust suppressant to be applied to unsealed road surface to limit dust generation from vehicular movements
  - Watercart to be employed to spray down the road during exceptionally dry/dusty conditions

- Potential to close the Glenwood Trailhead to Summit shuttle route to public vehicles to reduce user conflict and manage the associated safety risks

## 6.5 Trail Signage

### 6.5.1 Overview

*Dirt Art* recommend a new signage system to be developed that is specific to the proposed mountain bike network and ensure important information is conveyed to riders in a clear and concise manner. Trailhead maps should be placed at all major trailheads and form the primary source of trail-related information pertaining to trail lengths, difficulties, direction, and location. Additional information should also be displayed such as site-specific alerts, current trail closures, and relevant warnings. It is important that riders understand that mountain biking is an inherently dangerous sport, and they undertake the exercise at their own risk.

IMBA's TDRS should be utilised to classify all mountain bike trails within the network with nearby fire trails, walking tracks, and access tracks shown in relating trail maps. Classification of the adjoining trails should comply with the relevant Australian Standard or NSW specifications.

### 6.5.2 Existing Signage

The signage design will need to be carried out in close consultation with the respective land managers as the proposed trails cross through multiple land tenures. Signage will need to be mindful of the existing land uses and other user groups. For instance, in Glenwood State Forest, the area is still used as an active forestry site with ongoing harvesting operations. As such, any trail-related signage needs to be complementary to the existing signage systems in place and not adversely impact the daily operations of the land manager. Furthermore, in the SCA, NPWS have an established network of walking trails and access tracks that are already signposted. The proposed trail network is to be integrated into this existing system with signage that is sympathetic to what is already established. The trail signage can look-and-feel different to what already exists, but any maps should include existing walking trails as well as nearby roads/tracks.

### 6.5.3 Proposed Signage Location

Please refer to the signage concept plan attached on the following page.

## 6.5.4 Signage Types

### 6.5.4.1 Primary Map/Signage Boards

*Dirt Art* suggest that major sign boards are located at the three Primary Trailheads identified in the trail network.

Trail map signage is the main signage board that will greet riders when they arrive at a trail head. The current trail map signage at both trail heads is inadequate in size and detail and does not provide visiting riders with the information to embark on their ride quickly and easily.

Signage should be large enough to allow several riders to view the trail maps and signage at the same time.

Trail maps signage should contain the following at a minimum:

- Vibrant branding
- High quality trail maps
- Trail names, difficulty ratings and lengths
- Shared/single use status of trails
- A summary of the IMBA trail difficulty rating system
- Emergency phone numbers/information
- General trail safety information
- General environmental (flora and fauna) information
- Weed and pathogen management info
- Emergency location point
- Website
- Social media pages and hashtags

*Dirt Art* also suggests the following information be considered:

- Link to Trailforks application (noting that all trails should be uploaded to the system before installation of signage)
- Local club/committee of management information
- Information regarding wet weather riding
- Trail/facility support and/or sponsorship information

#### 6.5.4.2 Secondary Map Boards

It is important to install secondary trail map signage at key major intersections, allowing riders to orientate themselves before they proceed through the intersection. *Dirt Art* proposes to install these secondary map boards at the five Trail Hubs identified throughout the trail network. These signs are typically smaller than primary trail maps signs, as they do not have the same requirements to be read by several riders at the same time. An important component of these signs is the addition of 'you are here' location marker to allow riders to easily locate and orientate themselves.

#### 6.5.4.3 Trailhead Signage

Trailhead signage is installed at the start of each trail. The signage is generally smaller and mounted on a single post. The signage should include the following information at a minimum:

- Trail name
- Trail difficulty
- Trail length
- Shared/single use status
- Emergency location point

#### 6.5.4.4 Wayfinding Signage

Wayfinding signage is required where the trail route is confusing or unclear. In most cases, the need for way finding signage at can be eliminated through improved trail network functionality. Where required, wayfinding signage should note the trail name and difficulty as well as any additional warnings such as an upcoming road crossing.

Wayfinding signage should be used wherever trails cross existing roads, fire trails or other tracks such as the established network of walking trails. Directional arrows are useful to inform which way the trail(s) heads towards in addition to a 'wrong way' sign on the opposite side of the sign to prevent trail users from entering the trail in the wrong direction – especially at existing trail/road junctions.

#### 6.5.5 Emergency Management

Signage is an important component of emergency management. An emergency location point should be added to all signage, with the corresponding points and grid references to be shared with local emergency services. Detailed grid reference information can also be added to signage if desired. Alternatively, a reminder for riders to utilise the Emergency Plus phone application is a useful means of acquiring location details to assist emergency services.

## 7 Implementation Plan

### 7.1 Detailed Trail Design

The concepts provided within this report represent high-level trail concepts with proposed trail corridors as opposed to final trail alignments. A process of detailed design will need to occur in the next stage of the project to refine the trail corridor and confirm the final alignment for construction. Like the concept design, the next stage will also need to take into consideration all environmental and cultural heritage sensitivities with specific strategies to avoid, mitigate, or offset the identified issues. These have already been highlighted and identified by The Environmental Factor and Apex Archaeology. The detailed design process will further refine the respective trail corridors and pinpoint the exact alignment of trail to ensure the best trail experience is produced while avoiding any ecologically sensitive or culturally significant areas.

Trail design and construction should only be undertaken by a professional trail builder with demonstrated experience working in sensitive ecological environments. In addition to this, they will need to sort the valuable input from suitably qualified ecologists and cultural heritage consultants with regards to prescribing a practical way of achieving a world-class trail product that is both sustainable and sympathetic to its natural environment.

Due to the density of the vegetation found throughout parts of the SCA, the proposed trail concepts/corridors have been flagged at regular 2-5m intervals for the purpose of allowing various consultants to locate and find their way along the proposed routes. They do not represent the final trail alignment to be constructed as these will need to account for various trail attributes such as berms, rollers, drainage, and other devices that are associated with creating a sustainable trail.

All trail concepts proposed have been extensively ground-truthed where possible, however, dense vegetation has inhibited access to some areas that will need to undergo extensive weed management prior to the final detailed design process to ensure a suitable alignment is established.

The trail concepts within Glenwood State Forest have been flagged at more sparse intervals as the area has been recently logged by Forestry. In these cases, the flagged route represents the general centreline of the proposed trail concept. *Dirt Art* has confirmed that the proposed trail corridors in these areas are suitable for trail construction and with the detailed design stage to refine the exact trail alignments and technical trail features by a suitably qualified trail professional.

## 7.2 Construction Approach

### 7.2.1 IMBA Guiding Principles

The majority of trail building methods and techniques are detailed in IMBA's *Trail Solutions* publication, which every professional trail builder uses as their guide document. It is therefore paramount that the design and construction of the proposed trail is undertaken by a professional trail builder with proven experience creating sustainable mountain bike trails in highly sensitive environments as opposed to a generic civil construction. The construction of roads and civil infrastructure is a markedly different space to the niche and specialist sector of trail design and construction. Trail builders work to the guiding principles set out by IMBA, whereas civil construction operates under a completely different set of parameters defined in the National Construction Code (NCC) and relevant Australian Standards. Trail builders have an intricate understanding of the dynamics of a trail. Whether it be the flow (i.e., the natural speed and ease of maintaining momentum) of the trail or careful three-dimensional manipulation of the trail's surface to passively shed and control water. The experience of a trail professional ensures a trail not only rides well but is safe and sustainable.

### 7.2.2 Proposed Construction Methodology

#### 7.2.2.1 Machine Construction

Most modern mountain bike trail construction is undertaken with mini excavators in the size range of 1.7 to 5 tonnes depending on the environment and trail style/outcome looking to be achieved. The use of excavators offers significant improvements in efficiency relative to hand-building in most environments with a more consistent results and ability to more subtly shape the trail surface to improve drainage throughout the trail entirety. A 1.5-1.8 tonne excavator is used for most trail applications in Australia, especially those working in remote or sensitive environments. *Dirt Art* confirms a machine in this size range would be suitable for all proposed trails in this plan. There have not been any trails concept identified in the network that cannot be machine-accessed or built.

For areas that are clearer and more disturbed, such as those within Glenwood State Forest, a bike park style of trail is proposed. For these larger footprint trails, a larger machine in the 5 tonne range and above is better suited to moving greater volumes of soil and creating the more labour intensive shapes such as the myriad of jumps and berm features amongst these trails.

#### 7.2.2.2 Hand-Build Construction

There are some areas of proposed trail that may require hand build construction methodology, particularly where high levels of ground rock are evident. Notably, *Dirt Art* has worked to minimise construction complexity and is confident that the majority of the trails are able to be constructed by excavator.

It is recommended that where possible machine construction is pursued, where this does not adversely impact the experience provided by a trail and where it does not substantially impact the character of the trail development.

Hand grooming works would also occur by hand and would include but not limit to; surface shaping, drainage/low area shaping, surface raking, shaping of dirt trail features, edge battering, rock work, vegetation pruning and naturalisation.

The proposed crew/team structure for each team would typically include 1-2 trail crew/labourers following each excavator. These 1-2 staff would work extensively to groom the trail surface, adjust drainage, shape berms rollers and jumps and complete rock armouring works as required.

### *7.2.2.3 Vegetation Clearance*

All vegetation clearance will occur within the constraints of any planning permit conditions for construction.

Prior to commencement of bench cutting, all standing vegetation within the trail alignment will be cleared a maximum of 20m ahead of the construction team. This forward clearing provides a clear picture of ground conditions, allowing for pre-emptive micro-alignment adjustment to avoid unforeseen ground conditions such as large areas of non-usable bedrock and/or large tree roots. Following standing vegetation clearance, all grasses, low-lying vegetation and organic matter will be cleared from the trail tread. Decomposing organic material, including fallen trees will also be removed from the trail tread. Prior to commencement of bench cutting there will be no remaining vegetation on the trail tread.

Low lying vegetation and organic material will be passively dispersed to the low side of the trail tread, beyond the low point of the eventual bench cut (i.e. no structural component of the trail will rest on vegetation or organic matter). Larger vegetation such as limbs, branches and shrubs will be removed from the trail tread area, so they are not visible to trail users. Larger vegetation will be passively dispersed rather than stockpiled, or alternatively may be chipped and spread through the trail verge area. Trail verges will where viable be thatched with cleared vegetation to limit the need for straw to be imported into the site, with the end result being no bare earth other than the trail tread itself.

Vegetation and any organic matter will not to be placed in or near any waterway, low area or area where water flow volumes are likely.

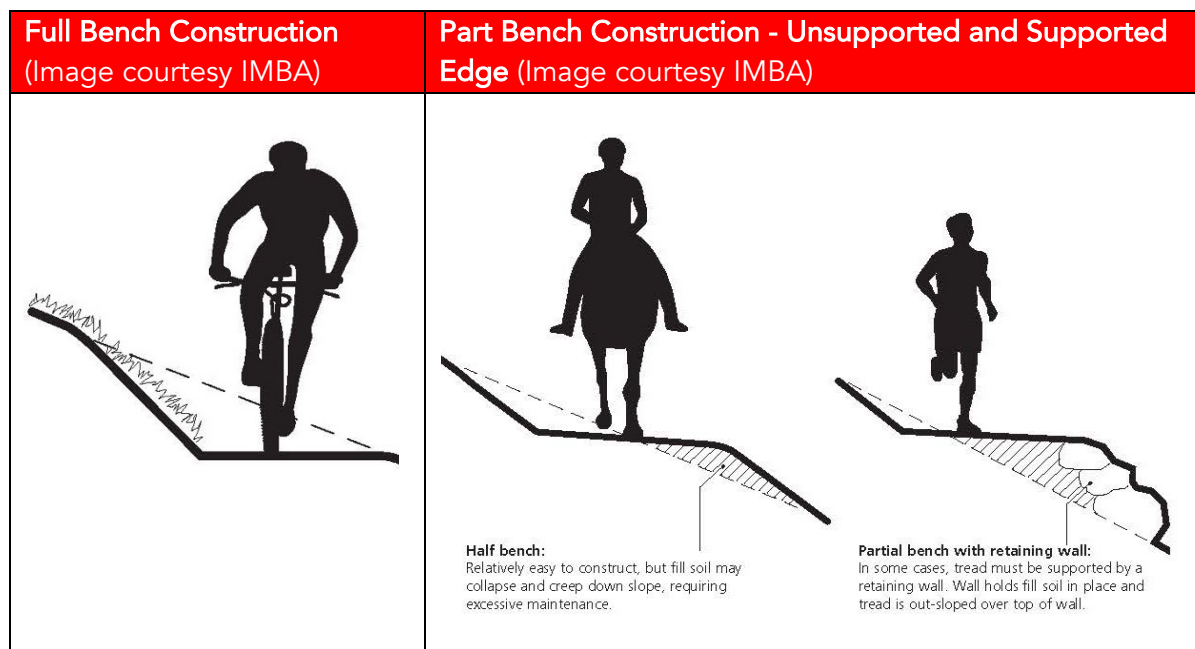
The final result would be a naturalised final trail product with no openly visible cleared vegetation debris.

### 7.2.2.4 Bench Cut

All bulk trail excavation works to be undertaken with a rubber-tracked mini excavator. The machines can be fitted with a tilt hitch head (if required) to allow for optimum trail shaping and edge battering work.

A full bench cut is the intended and preferred benching approach, though it is acknowledged that this is not always a viable approach, particularly in areas containing bed rock and/or tree roots. Partial bench construction may be used in areas where a full bench cut is not possible/viable, and where required would be supported with a low side stone wall and applicable trail anchors. Partial benched areas would be extensively excavator compacted using both bucket and track rolling compaction methodologies.

Viable excess soil material will be used to create a three-dimensional trail tread (rollers, berms etc.), with non-viable soil (including humus and topsoil) from the trail bench to be passively dispersed and naturalised at the low side of the trail bench. Topsoil may also be utilised on top side batters to aid with revegetation.

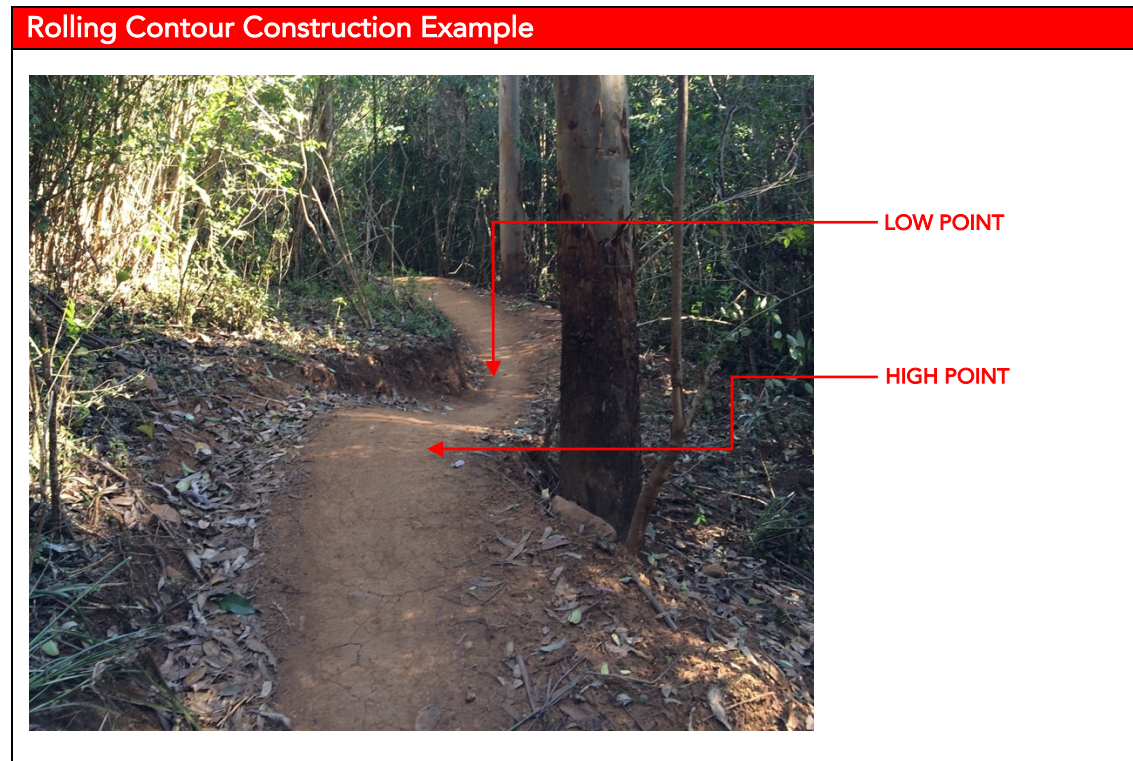


### 7.2.2.5 Edge Battering

The top-side edge of all trails would be battered to a target maximum gradient of 50-70% where viable, with a preferred slope at the lower end of this range. This edge battering increases the rideable area of trail tread, while also ensuring the long-term integrity of the trail batter. During machine construction a tilt head attachment assists greatly with this battering process. Edge batter treatments would be implemented as per the project scope, as required.

### 7.2.2.6 Rolling Contour Construction

All trails will be built in a rolling contour style, utilising frequent, large/meaningful grade reversals. This style of construction provides a free-flowing trail experience for mountain bike riders with optimal passive drainage at regular intervals. The rolling contour style of trail would provide meaningful grade reversals rather than smaller nicks or water bars.



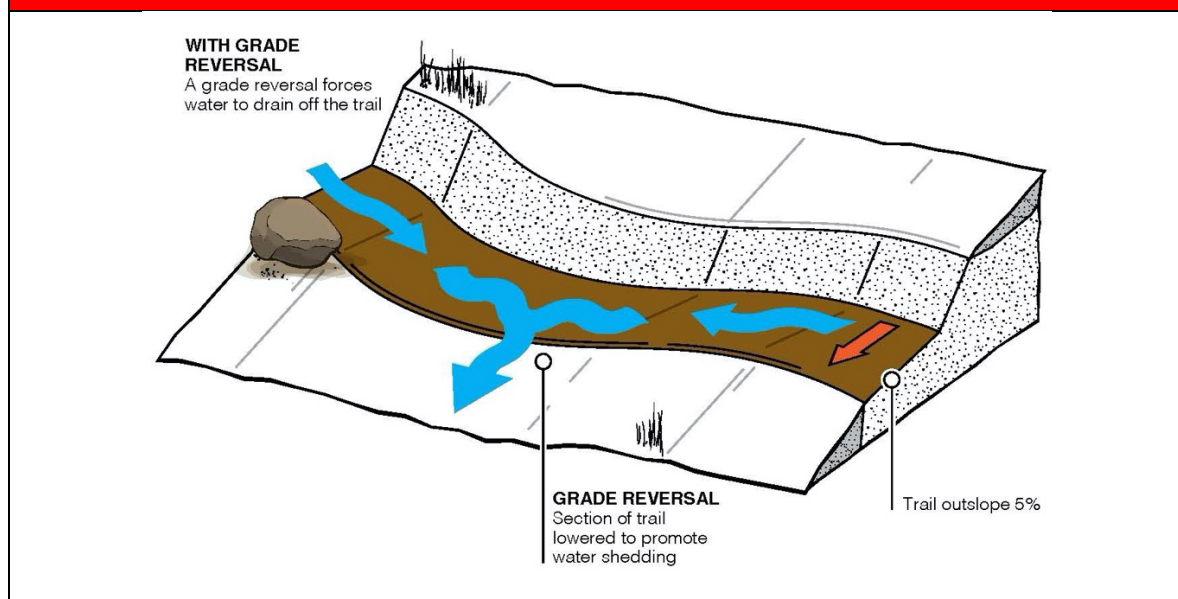
### 7.2.2.7 In sloping and Out-sloping

A rolling contour style of construction allows for much of the trail tread to be developed in a subtly in-sloping fashion. In-sloped trails provide greater rider confidence, improved trail edge stability and increase trail flow. When utilising an in-sloping style of trail, short, frequent out-sloping areas would be installed at the low points of the trail.

Out sloping areas would feature a minimum out-slope of 3-5% and would provide free draining potential for a minimum of 3000mm below the trail tread.

An in-slope/out-slope rolling contour construction approach dramatically reduces ongoing maintenance demands, by reducing the area of drainage that needs to be re-profiled through normal wear and tear. Rather than re-profiling long sections of trail to reinstate drainage, only short sections of low area trail would require maintenance.

## In-sloped and Out-sloped Trail Diagram



### 7.2.2.8 Chokes and Anchors

Chokes and anchors will be used subtly on the outside aspects of trails, particularly on corners. Rocks and chokes will not restrict the rider's ability to safely lean into trail sections and would not be placed where they are likely to catch pedals or derailleurs. Chokes and anchors will be rock where possible, and where timber is used no sharp edges should remain that may pose a safety risk to riders.

Chokes and anchors will in the majority of cases not be used to slow/calm the trail, instead grade reversals should be utilised. In *Dirt Art's* experience chokes and anchors used to slow/calm the trail typically result in hard braking and reduced trail flow, increasing trail wear and associated environmental impacts. Final trail design efforts would attempt were possible to calm trail speeds through effective grade reversals rather than relying on chokes/anchors to reduce user speeds.

### 7.2.2.9 Drainage

Effective drainage throughout the trail network will be achieved through the use of a rolling contour style of trail, featuring frequent grade reversals. Pipes and culverts will be generally avoided where possible with a preference on passive drainage techniques. Any desired/required alternation to this approach will be negotiated with the principal. Topside edge drains (French drains) will be utilised only where significant water down-flow and/or water seepage is likely.

Sediment run off will be managed in a range of ways, primarily through immediate compaction and through the use of frequent grade reversals. Silt traps and related measures will install as required and as per the project scope and/or at the direction of the principal.

#### *7.2.2.10 Compaction*

All trail surfaces will be effectively groomed and compacted both by excavator and by hand during construction. Sections of trail will be compacted and groomed immediately post excavator construction to minimise the risk of sediment run-off into surrounding bush land and water courses.

No trail section longer than 50 metres would be left uncompacted at any one time, with this length to be shortened in periods of wet weather.

#### *7.2.2.11 Rock Armouring*

Rock armouring will be installed in areas prone to water flow and/or standing/seeping water. When installing rock armouring larger, flat edge rocks would be used where possible- rock of a 'toaster to microwave' size would be the target rock size. Where smaller rock is prevalent, the beginning and end row of each rock armoured section should be composed of the largest rocks available, using a flag stone construction approach. Where smaller, flat rocks are prevalent, a 'pitching' style of armouring should be utilised.

When rocks are collected from outside of the track's immediate tread, the following restrictions will apply for stockpiling and transporting rocks:

- Rocks will be transported either by being carried by hand or wheelbarrow / cart. If a wheelbarrow or cart is used, it will not be wheeled over any creeks or wet areas without the use of a temporary platform.
- Random and varying routes will be used when collecting or searching for rock so as to reduce the risk of impacts by passing over the same area outside of the track's corridor
- All persons and equipment must remain outside of any bogs.
- Collected rocks will be stockpiled within the immediate corridor of the track that will be cleared of vegetation.

Corrals (typically rock) would be installed to ensure that riders remain on the armoured trail surface.

#### *7.2.2.12 Naturalisation*

All completed trail sections would be effectively naturalised. Naturalisation utilises older organic materials to return the trail verges to a more 'natural looking' state.

### 7.2.3 Volunteer Construction

While there may be some opportunities to facilitate volunteer construction, ultimately, *Dirt Art* suggest that the project should be planned and budgeted on a complete commercial construction process to continuity in the trail finish and a superior end product.

### 7.2.4 Climatic Considerations

Construction of the proposed trail network should be viable year-round, with optimal build seasons being Spring and Autumn. Given the elevation of Mount Canobolas, winters will be harsh with sporadic snowfall potential, especially towards the summit, and frosty temperatures potentially affecting trail construction works. As such, it is anticipated progress will be potentially slower during the months of June-August due to the weather conditions.

## 7.3 Signage

### 7.3.1 Overview

Effective signage is critical for the functionality of any destination mountain bike project, while also assisting in risk and incident management. The signage should focus on large map boards, as well as trailhead and wayfinding signage.

Signage should be consistent with relevant council and land manager signage systems and guidelines.

An important consideration is also main road signage, ensuring that visitors are aware of the attraction as they approach via vehicle. Road signage should be consistent with the respective land managers' guidelines.

### 7.3.2 New Brand Development

*Dirt Art* suggest that a brand/identity be developed for the trail project by a professional branding agency. This branding should be utilised along with a style guide to influence all digital presence and signage for the trails.

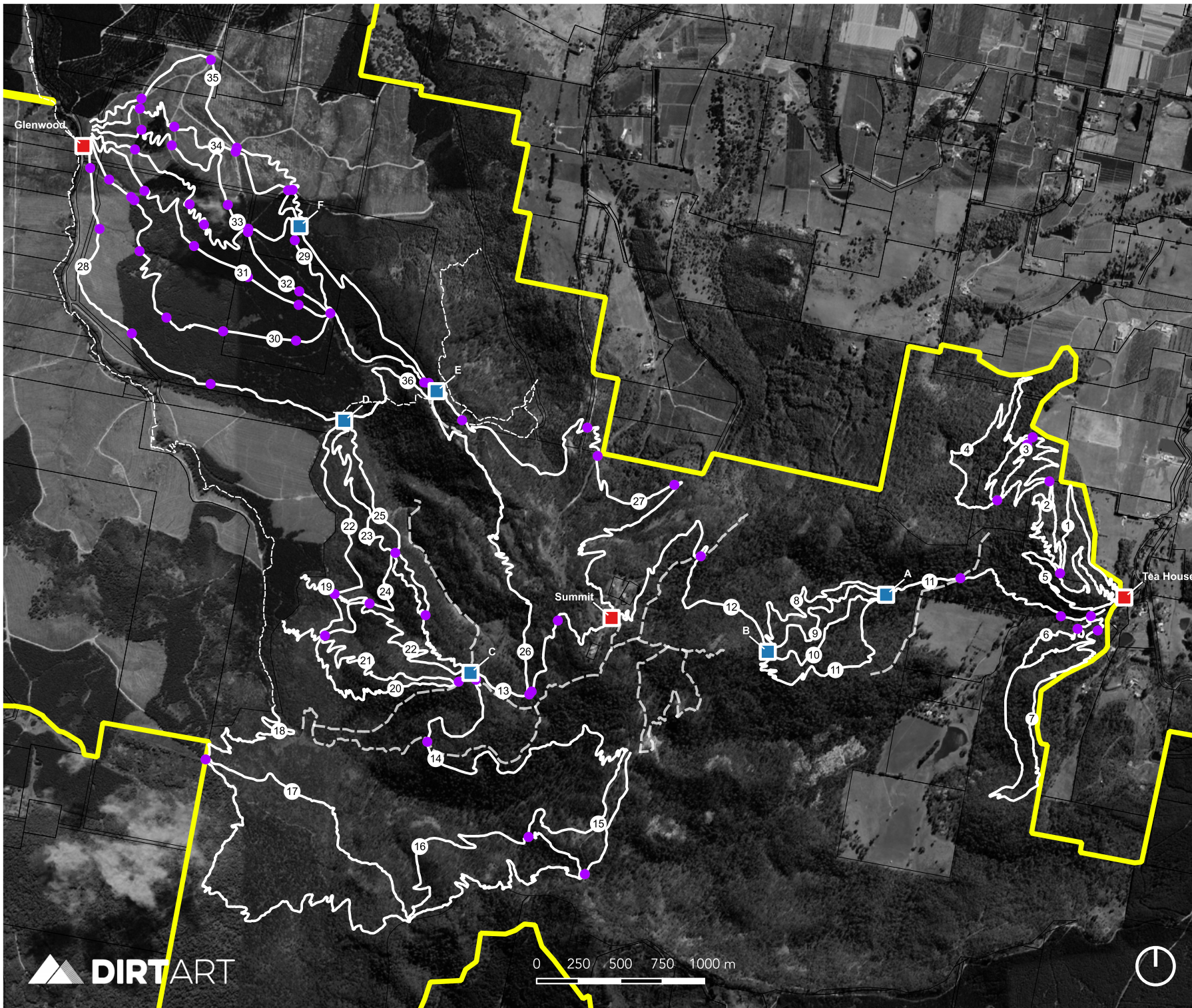
### 7.3.3 Budget

*Dirt Art* suggest a signage budget of 2.5% of capital investment (\$25,000/\$1m investment).

# Mount Canobolas MTB Project

## SIGNAGE PLAN: OVERVIEW MAP

25.06.21

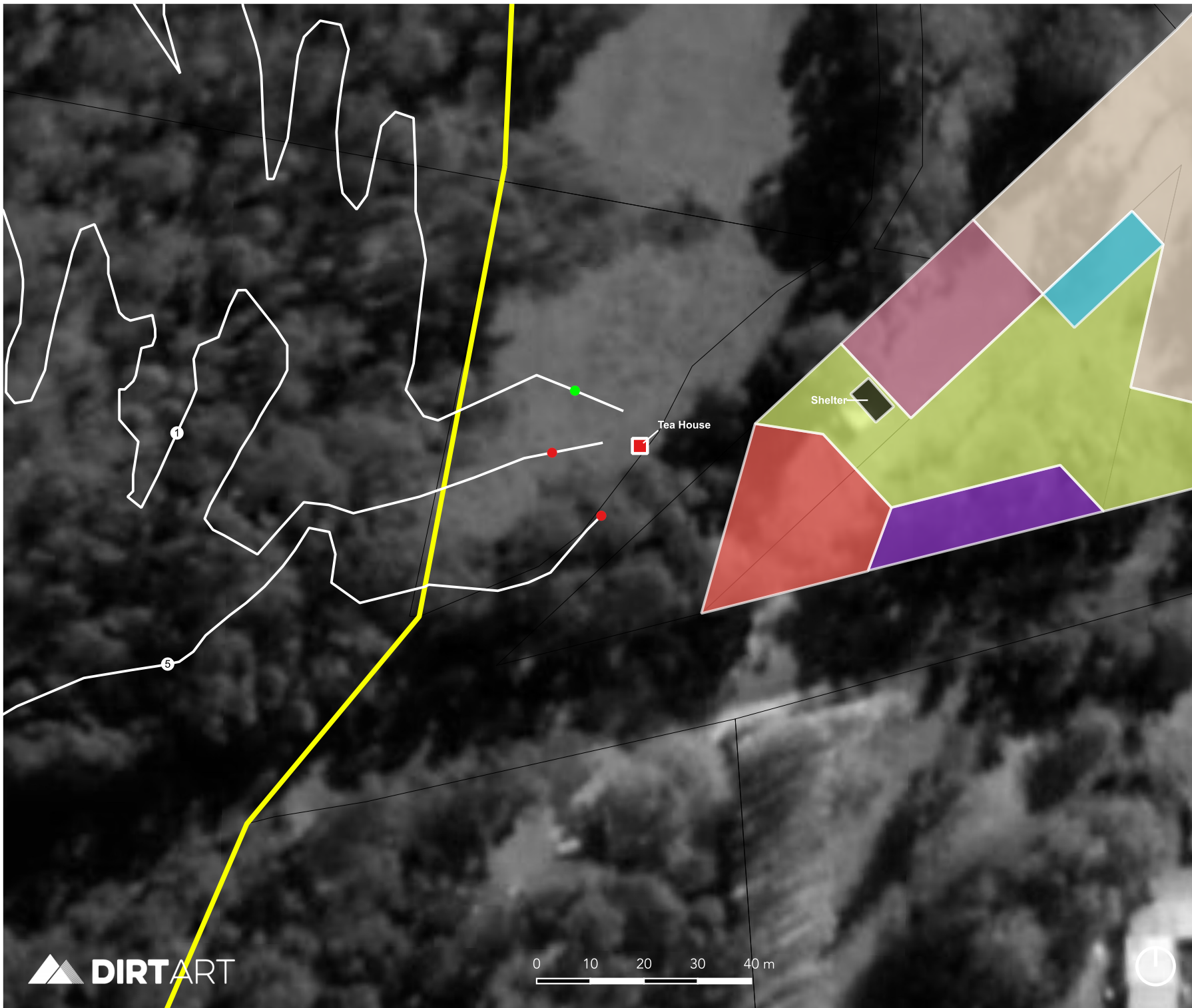


- Signage Plan
- Signage - Trailhead
  - Signage - Trail Hub
  - Signage - Trail Start
  - Signage - Trail End
  - Signage - Trail Crossing
  - All Trails
- Base Layers
- Study Area copy
  - Road
  - Existing Track
  - Lot
  - Contour

# Mount Canobolas MTB Project

## SIGNAGE PLAN: TEA HOUSE

25.06.21



**Proposed Infrastructure**

- Existing
- Amenities
- Landscaped Area
- Pump Track
- Shuttle Bay (Commercal)
- Shuttle Bay (Private)
- Carparking

**Signage Plan**

- Signage - Trailhead
- Signage - Trail Hub
- Signage - Trail Start
- Signage - Trail End
- Signage - Trail Crossing
- All Trails

**Base Layers**

- Study Area copy
- Road
- Existing Track
- Lot



# Mount Canobolas MTB Project

## SIGNAGE PLAN: SUMMIT

25.06.21



**Proposed Infrastructure**

- Existing
- Amenities
- Landscaped Area
- Pump Track
- Shuttle Bay (Commercal)
- Shuttle Bay (Private)
- Carparking

**Signage Plan**

- Signage - Trailhead
- Signage - Trail Hub
- Signage - Trail Start
- Signage - Trail End
- Signage - Trail Crossing

**All Trails**

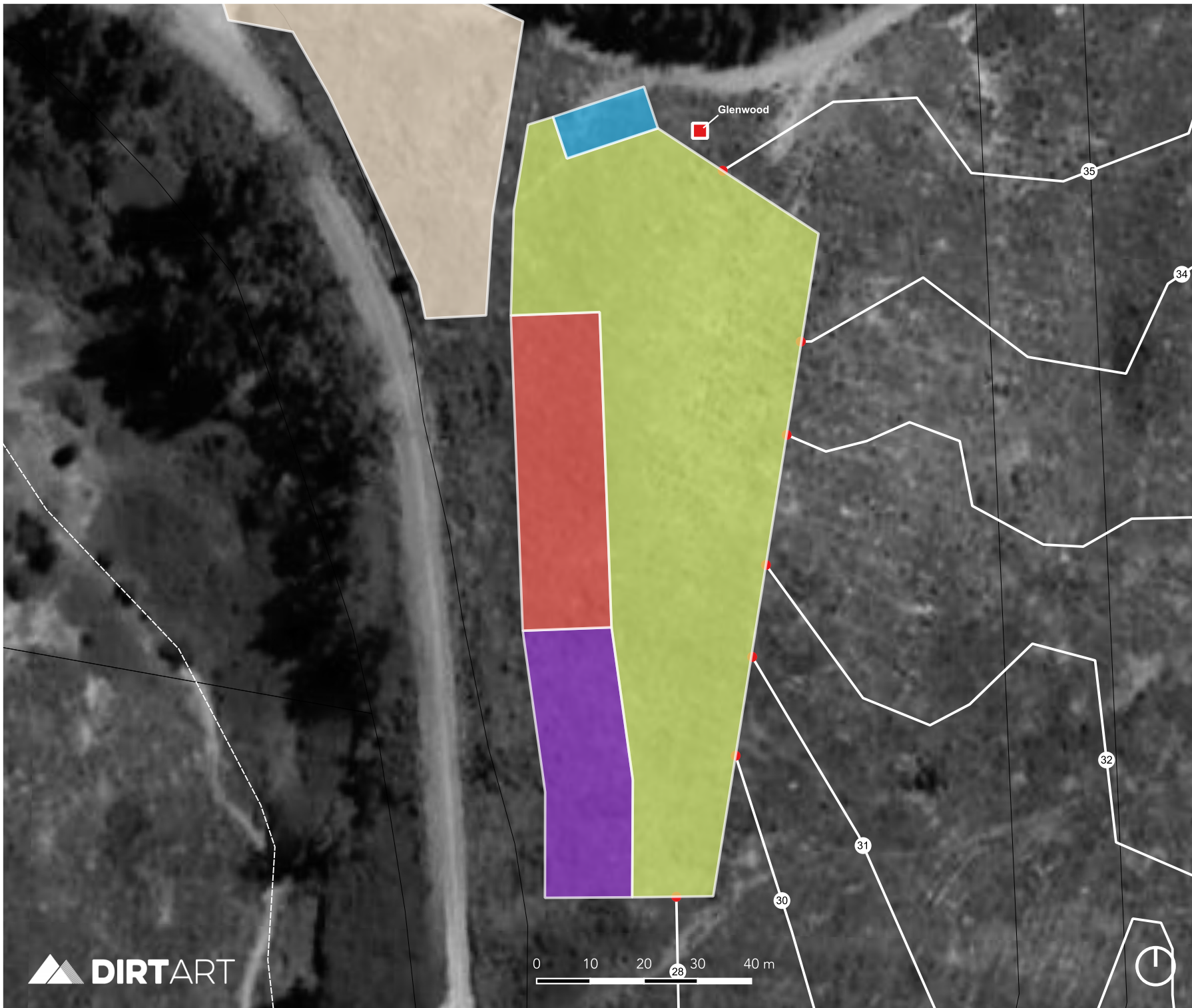
**Base Layers**

- Study Area copy
- Road
- Existing Track
- Lot

# Mount Canobolas MTB Project

## SIGNAGE PLAN: GLENWOOD

25.06.21



### Proposed Infrastructure

- Existing
- Amenities
- Landscaped Area
- Pump Track
- Shuttle Bay (Commercal)
- Shuttle Bay (Private)
- Carparking

### Signage Plan

- Signage - Trailhead
- Signage - Trail Hub
- Signage - Trail Start
- Signage - Trail End
- Signage - Trail Crossing

### All Trails

All Trails

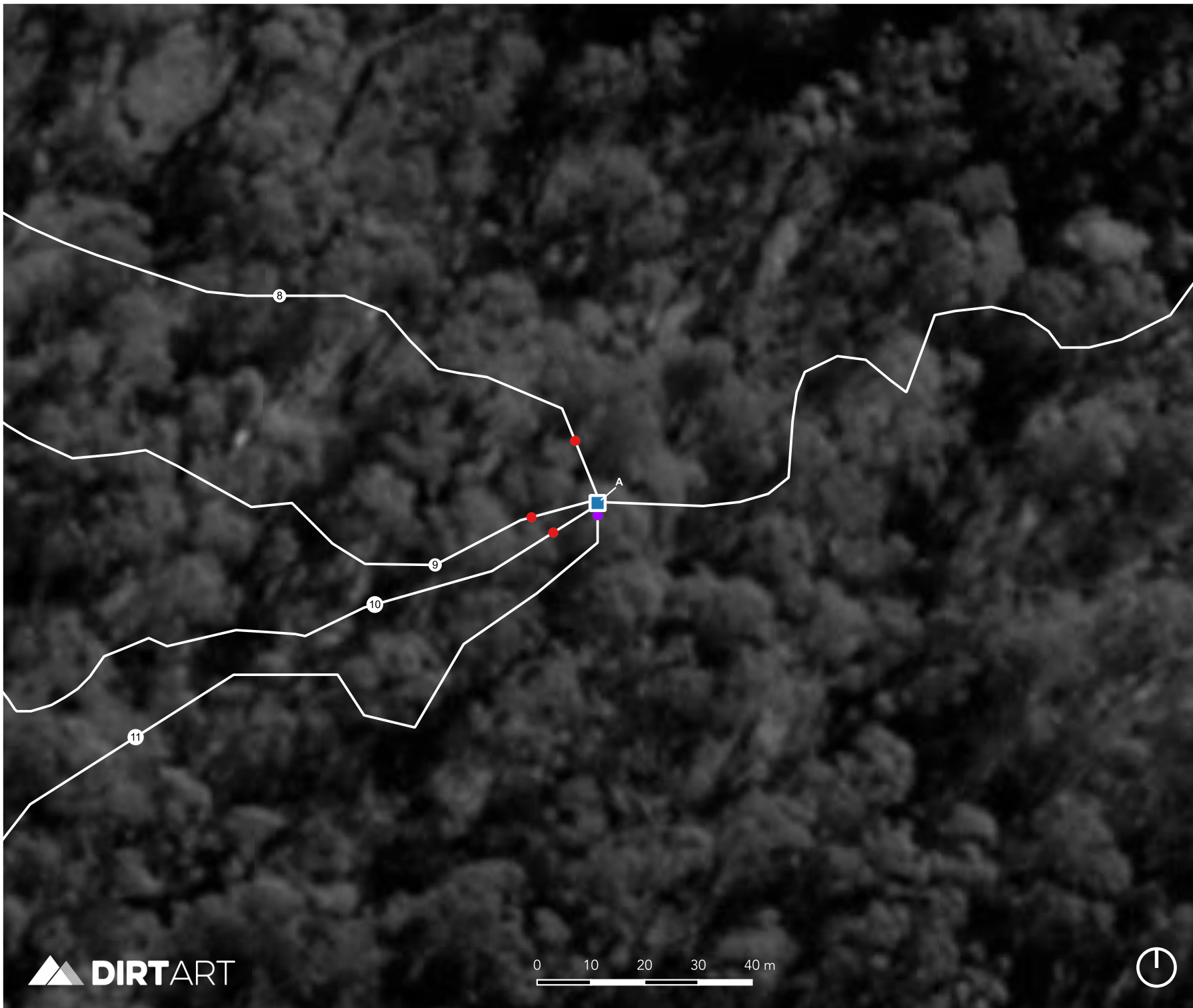
### Base Layers

- Study Area copy
- Road
- Existing Track
- Lot

# Mount Canobolas MTB Project

## SIGNAGE PLAN: TRAIL HUB A

25.06.21



Proposed Infrastructure

- Existing
- Amenities
- Landscaped Area
- Pump Track
- Shuttle Bay (Commercal)
- Shuttle Bay (Private)
- Carparking

Signage Plan

- Signage - Trailhead
- Signage - Trail Hub
- Signage - Trail Start
- Signage - Trail End
- Signage - Trail Crossing
- All Trails

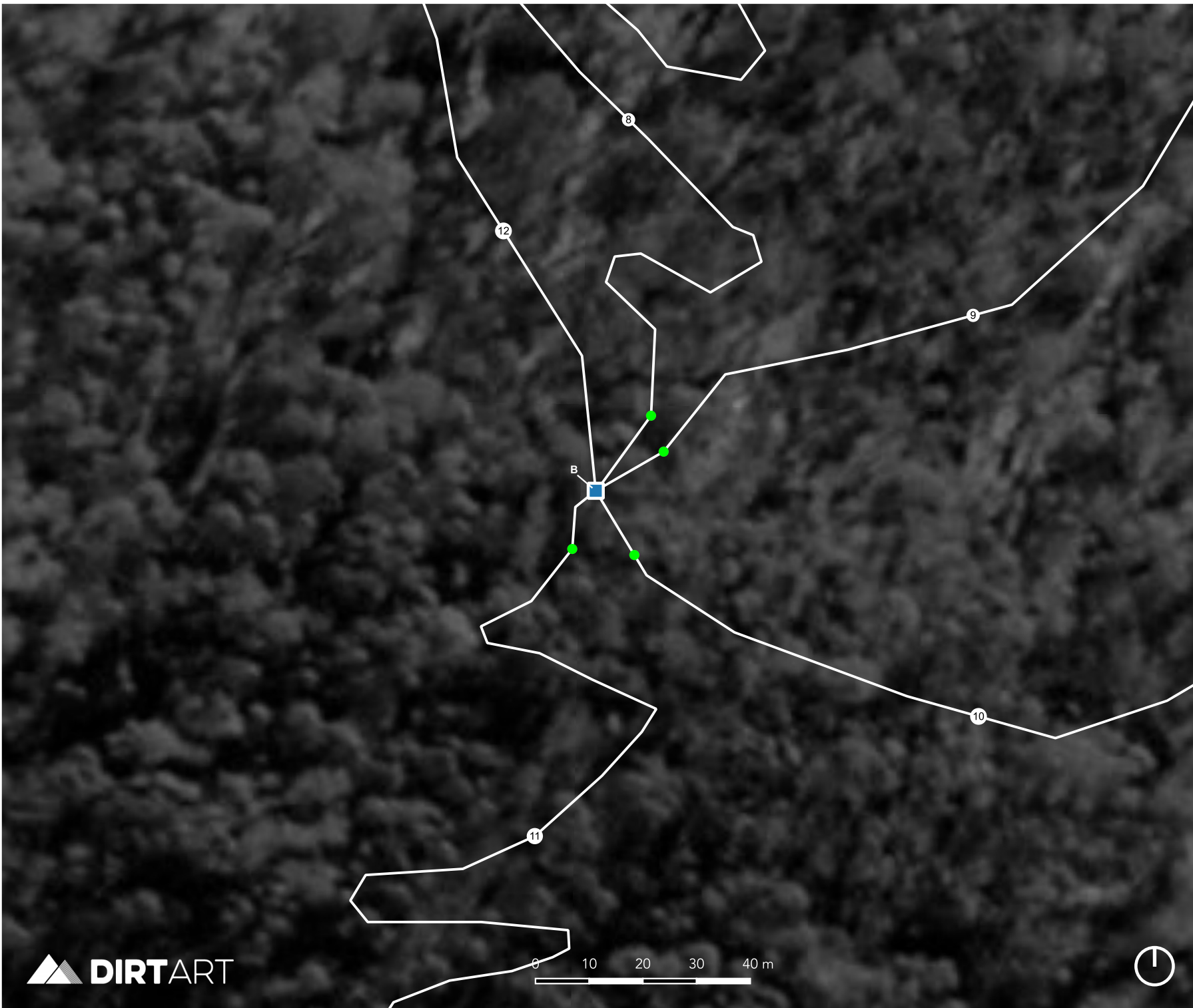
Base Layers

- Study Area copy
- Road
- Existing Track
- Lot

# Mount Canobolas MTB Project

## SIGNAGE PLAN: TRAIL HUB B

25.06.21



Proposed Infrastructure

- Existing
- Amenities
- Landscaped Area
- Pump Track
- Shuttle Bay (Commercal)
- Shuttle Bay (Private)
- Carparking

Signage Plan

- Signage - Trailhead
- Signage - Trail Hub
- Signage - Trail Start
- Signage - Trail End
- Signage - Trail Crossing
- All Trails

Base Layers

- Study Area copy
- Road
- Existing Track
- Lot

# Mount Canobolas MTB Project

## SIGNAGE PLAN: TRAIL HUB C

25.06.21



Proposed Infrastructure

- Existing
- Amenities
- Landscaped Area
- Pump Track
- Shuttle Bay (Commercal)
- Shuttle Bay (Private)
- Carparking

Signage Plan

- Signage - Trailhead
- Signage - Trail Hub
- Signage - Trail Start
- Signage - Trail End
- Signage - Trail Crossing
- All Trails

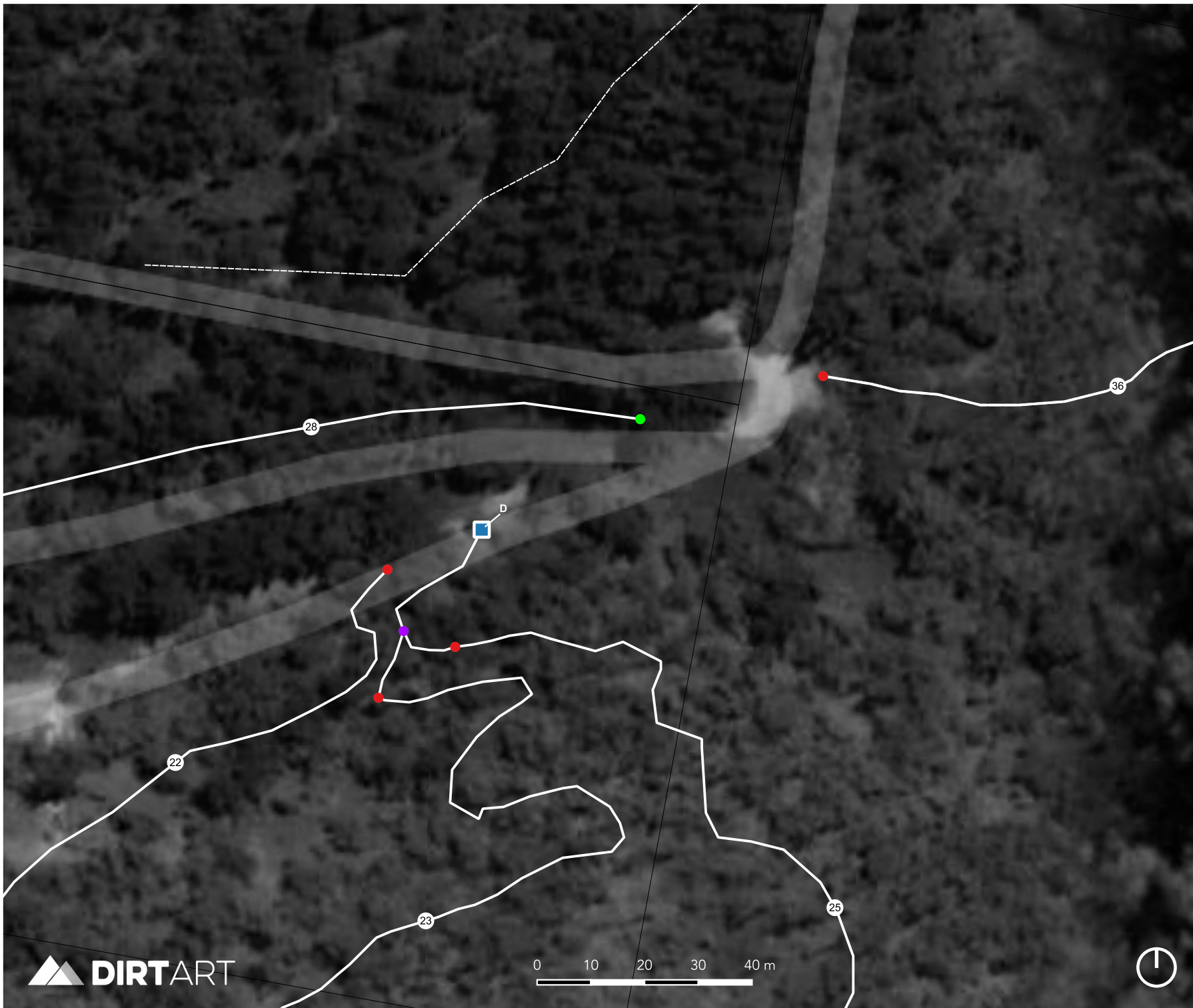
Base Layers

- Study Area copy
- Road
- Existing Track
- Lot

# Mount Canobolas MTB Project

## SIGNAGE PLAN: TRAIL HUB D

25.06.21



Proposed Infrastructure

- Existing
- Amenities
- Landscaped Area
- Pump Track
- Shuttle Bay (Commercal)
- Shuttle Bay (Private)
- Carparking

Signage Plan

- Signage - Trailhead
- Signage - Trail Hub
- Signage - Trail Start
- Signage - Trail End
- Signage - Trail Crossing
- All Trails

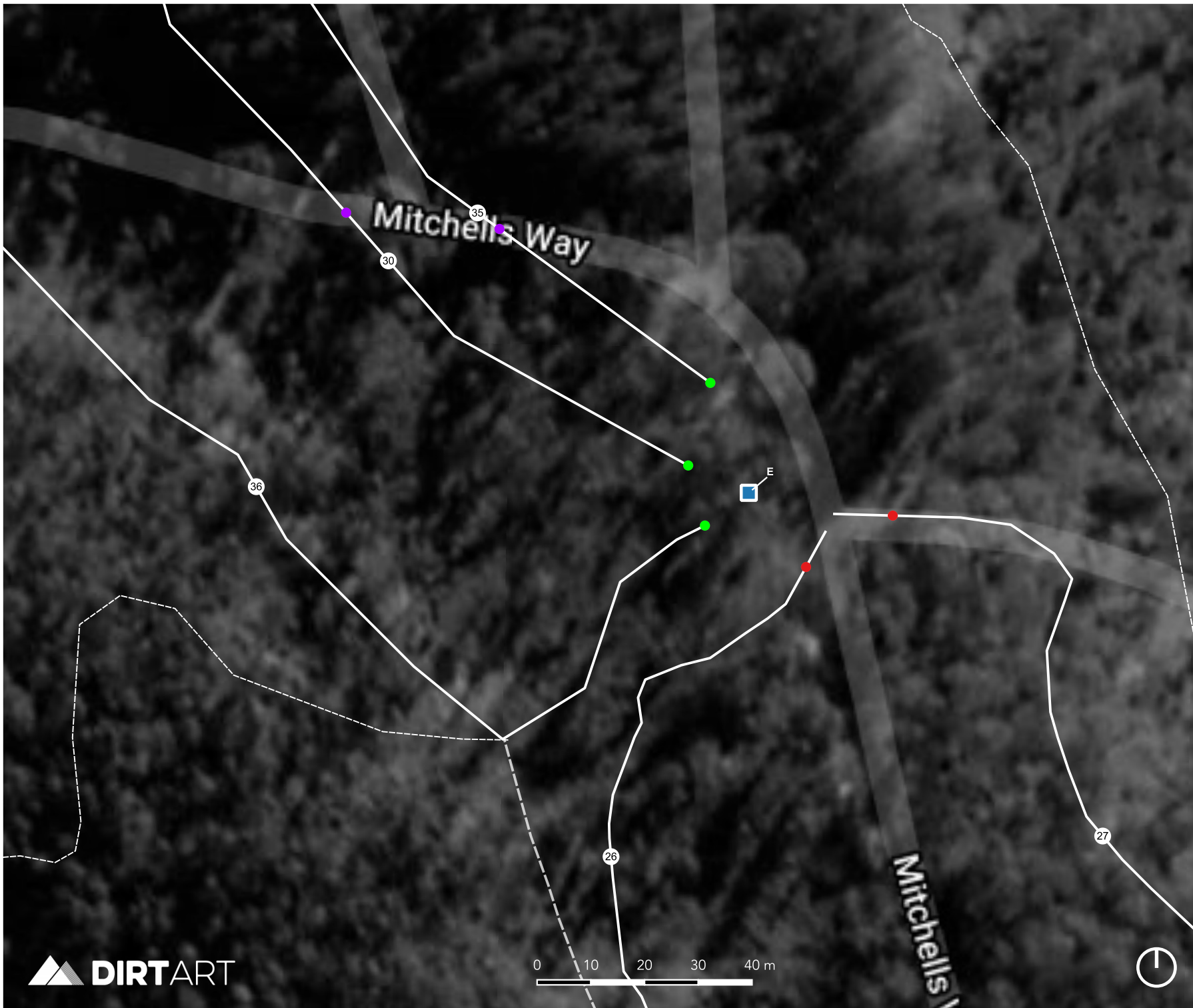
Base Layers

- Study Area copy
- Road
- Existing Track
- Lot

# Mount Canobolas MTB Project

## SIGNAGE PLAN: TRAIL HUB E

25.06.21



Proposed Infrastructure

- Existing
- Amenities
- Landscaped Area
- Pump Track
- Shuttle Bay (Commercal)
- Shuttle Bay (Private)
- Carparking

Signage Plan

- Signage - Trailhead
- Signage - Trail Hub
- Signage - Trail Start
- Signage - Trail End
- Signage - Trail Crossing

All Trails

Base Layers

- Study Area copy
- Road
- Existing Track
- Lot

# Mount Canobolas MTB Project

## SIGNAGE PLAN: TRAIL HUB F

25.06.21



Proposed Infrastructure

- Existing
- Amenities
- Landscaped Area
- Pump Track
- Shuttle Bay (Commercal)
- Shuttle Bay (Private)
- Carparking

Signage Plan

- Signage - Trailhead
- Signage - Trail Hub
- Signage - Trail Start
- Signage - Trail End
- Signage - Trail Crossing
- All Trails

Base Layers

- Study Area copy
- Road
- Existing Track
- Lot

## 8 Operational Considerations

### 8.1 Management Models

*Dirt Art* suggest that the trails are managed under a single management entity. For most projects of this type this entity would be a local government agency. While this does not necessarily require the agency to accept management responsibility, it ensures the public have a clear contact point for the trails. In most cases this type of agreement would involve the lease/license of trail corridors rather than entire land parcels.

*Dirt Art* suggest that the future maintenance of the trail network will likely be best delivered through a combination of paid and volunteer maintenance. The new trail development proposed is likely to bring significant additional local visitation to the park, which may provide opportunities to re-invigorate the past volunteer construction program to an extent.

### 8.2 Trail Maintenance

Trail maintenance is one of the key operational considerations of any trail destination. In general terms, a high-quality mountain bike destination will require regular maintenance, to ensure trails are maintained to a standard expected by the traveling mountain bike rider.

*Dirt Art* suggest a maintenance budget of approximately \$2.00/metre annually for trails.

While some volunteer maintenance may be possible, *Dirt Art* suggests that maintenance should be budgeted at the above commercial rates. While volunteers contribute meaningfully to maintenance of many trail networks, their capacity to manage larger-scale tourism focused trail networks is extremely limited.

The following aspects of trail maintenance are to be considered by the land manager with nominal timeframes recommended for each key task. The regularity of the tasks will be affected by weather conditions both in terms of seasonality (high visitation during peak seasons) as well as more urgent tasks needing attention immediately following a natural weather event such as a storm.

#### 8.2.1 Trail Audit

##### 8.2.1.1 Formal Audit

**Nominal Timeframe:** 6-12 months

Each trail in the network should undergo a scheduled audit by a trail professional who understands the underlying dynamics at play on a trail as well as the sustainability of the trail itself. They should have an aptitude for recognizing elements of the trail that may affect rider safety at the foremost, but also have the experience and knowledge to provide

quantified data in terms of what is required to keep the respective trails operating at their best.

The trail audit should list remediation items in the following priority:

1. Rider safety
2. Environmental issue
3. Trail experience

The formal trail audit should form the basis of the maintenance schedule for the land manager and aid the effective roll-out of trail crews to targeted areas of the network.

#### *8.2.1.2 Informal Audit*

**Nominal Timeframe:** Daily / Weekly

An easy and effective way of keeping up to date with the latest trail conditions is to upload the trail network to an online database such as Trailforks. The online trail database is easily accessible with any smartphone or device and has a large following by riders not only in Australia, but amongst an international audience. The application allows users to add live data or information to trails as they ride them. This includes updates about the condition of trails or any issues that maybe current for the individual trail. For example, a fallen tree maybe noted on a particular section of trail by users or alternatively, riders have the option of updating the status of a trail as being 'too wet to ride' after heavy rainfall.

The informal means of acquiring trail data only helps to paint a clearer picture for the land manager and acts as a second way of ensuring the trails are remain in satisfactory condition. Furthermore, applications such as Trailforks now have synergies with other user applications such as Strava, which can give land managers valuable insight and statistics as to how often specific trails are ridden, when they are ridden, and which trails or group of trails are the most popular in the network. This feedback can help inform trail maintenance in terms of targeting or prioritizing tasks on trails the exhibit a high usage rate or on the contrary, those that receive less visitation perhaps needing more attention to specific tasks such as vegetation pruning.

#### *8.2.2 Basic Maintenance Tasks*

**Nominal Timeframe:** Monthly

The key to effective trail maintenance is undertaking a selection of basic tasks on a frequent or regular basis. These tasks should form the basis of ongoing trail audits to document the works required as well as formally signing off on the work as they are completed. The nature of the tasks is relatively easy with some basic level of knowledge and training required. The majority of the maintenance tasks identified can be undertaken with a combination of hand and power tools as opposed to requiring heavy plant and specialist equipment.

Example of basic maintenance tasks:

- Vegetation pruning
  - Maintaining the trail corridor both in terms of width and height
  - Includes strategic pruning to open up sightlines at critical areas as well as on the inside of corners where riders typically lean their bike/body
- Removal of debris or organic material from the trail tread
  - Particularly important after storms or high winds
  - E.g., Fallen branches, excessive leaf matter, loose rocks, etc
- Clearing out or reinstating drains
  - Removing sediment or debris from drains
- Minor reprofile of trail tread / surface
  - Reinstating 5% crossfall on in-sloped or out-sloped sections of trail
  - Remove any signs of surface cupping or erosion by addressing the underlying issue, e.g., installing additional drainage
- Closing any informal lines and/or features that may have developed over time
  - This includes formally closing the informal lines/features with appropriate measures such as signage or bunting
  - Rehabilitating and naturalising the closed line with organic matter and debris

### 8.2.3 Major Maintenance Tasks

**Nominal Timeframe:** 1-3 years

The following trail maintenance tasks are those categorized as requiring the professional services of a suitably qualified trail builder. They are typically more complex tasks that will require heavy machinery such as a mini excavator or similar as well as specialist knowledge and experience to successfully complete the job.

Example of major maintenance tasks:

- Trail resurfacing
  - Freeride trails will typically attract large visitation due to their popularity in trail style as well their repeatability with a shuttle service
  - The natural wear and tear of these trails is subsequently greater not only due to the high traffic volume, but also due to the trail's particular attributes such
    - Wider trail tread
    - Larger bike park style trail features such as berms, drops, and jumps
    - Higher trail speed
  - The top layer of these machine-buffed freeride trails will generally be much smoother than their more trail-riding-orientated counterparts as they rely on riders being able to maintain speed without excessive pedaling or braking to successfully clear the respective technical features such as jumps or drops

- As such, these type of higher impact trails require significant surface work to remove larger in situ rocks as they come to the surface over time to keep the trail running fast and consistent, which resultingly make the trail safe to ride
- Shaping / Fine-tuning
  - As the surface of freeride features such as jumps or drops deteriorate over time, the careful eye of a professional trail builder is required to reinstate the shape of the feature to ensure its safety
    - For example, the radius of a jump's take-off or 'lip' (as it is commonly referred to) has a direct correlation to its overall safety. With rider traffic and natural erosion from the elements, a jump lip's surface will degrade over time and subsequently change the ride dynamics of the respective feature.
- Rock armouring
  - In areas where there are ongoing erosion issues or high retention of water, rock armouring may be deemed as the best solution
    - For example, no matter how well you design and construct trails, there is always a chance that unforeseen issues arising from the natural environment may arise such as a hidden underground spring causing ongoing oversaturation of a trail
  - It will be a case-by-case-basis, but a decision will need to be made as to whether rock available onsite will be used or if there is a requirement to import materials for the purposes of the armouring task
- Medium to heavy reprofile of trail tread / surface
  - Where more significant works are required to reprofile a trail surface, a machine such as an excavator should be employed to achieve a superior surface finish while maximizing efficiency
  - Hand work in this case should be limited to final grooming works
- Trail Realignment / Feature Adjustment
  - Should a section of trail or specific technical trail feature deemed to be no longer safe or sustainable, a suitable realignment or adjustment may be deemed necessary
  - In this case, only a suitably qualified trail professional should undertake the re-work to ensure its consistency with the rest of the trail and its relating safety for riders

### 8.3 Uplift Opportunities

Uplift-assisted riding is growing in popularity, with a number of services across Australia proving highly popular with local and visiting riders. Uplifting is generally undertaken using buses and/or 4WD vehicles using trailers or bike racks to transport bikes.

## 8.4 Risk and Incident Management

### 8.4.1 Overview

Risk and incident management is a critically important consideration for any mountain bike trail development and should be considered continually throughout the development and construction process.

A risk and incident management plan, including detailed evacuation planning and incident management is a critical component of facility planning, and must be completed prior to the opening of the trail network.

### 8.4.2 Key Considerations

Incidents can be minimised through the following key considerations.

- Predictability in trails
- Low consequence trail features (limited gap jumps, blind drops etc.)
- Appropriate trail difficulty grading
- Appropriate signage
- High-quality trail design and construction
- Evacuation points
- Evacuation procedures

#### 8.4.2.1 *Predictability in Trails*

Predictability is one of the major attributes that helps lower the risk of incidents on trails. To achieve predictability, the trail needs to maintain a level of consistency from the outset, that is, from the start through to the finish of a trail. For example, if a trail is designed and identified as a 'flow trail', the subject rider would expect to experience a fast and flowing set of trail features comprising predominately of smooth and sweeping bends that are well-supported by banked or 'bermed' corners. In this regard, it is best practice not to have the natural character of a trail change unannounced or suddenly in the middle of a trail to a rocky and technical style of trail. This would make the trail 'unpredictable' and subsequently pose a potential hazard to riders as their level of expectation is not aligned with the overall trail offering.

#### 8.4.2.2 *Low Consequence Trail Features*

Consequence refers in this case refers to the ability of a rider to make a mistake due to poor judgement or lack of riding ability and not result in serious injury to the individual. For example, if a trail is defined as a beginner to intermediate technical trail, the features should all be 'rollable' and or designed as tabletop jumps as opposed to large gap features. A gap in this sense would be defined as a physical or visually prominent space between the jump's take-off point (lip) and corresponding landing. Should a rider misjudge

the speed required and come up short on the jump feature, they should land on the flat part of the tabletop or the 'knuckle' of the landing – allowing them adequate time and ability to recover. In other words, a reasonable margin for error.

#### *8.4.2.3 Appropriate Trail Difficulty Grading*

Trails should be graded by their difficulty as defined in the International Mountain Bicycling Association's (IMBA) trail difficulty rating system (TDRS). The TDRS is a basic method to categorise trails into various levels of difficulty as defined below:

- White Circle
- Green Circle
- Blue Square
- Black Diamond
- Double Black Diamond

The system is commonly accepted as the international standard at the majority of major mountain biking destinations and bike parks. For non-riders, the difficulty rating system references a similar hierarchy in the ski and snowboard industry.

It is important to note that trail difficulty should be subject to regional considerations and respective of the local offerings in terms of their classification. For example, a Black Diamond trail in a world-renowned destination such as Whistler (Canada) will likely be harder than something that is defined as the same grade in a much smaller local network that does not have the same volume of trail or type of challenging natural terrain.

#### *8.4.2.4 Appropriate Signage*

Trail signage should be designed and installed by a suitably qualified trail professional who understands the intricacies of signage location, orientation and functionality. Notably, there can be significant safety and liability issues associated with trail signage not installed correctly. Signs need to convey crucial information such as trail difficulty and safety information in a clear and concise manner. The location of specific signage is essential in ensuring rider safety and managing risk in a trail network. The whereabouts and orientation of a sign can be the difference between a rider seeing, acknowledging, and accepting the risk related to the trail and respective features they are about to embark upon; or alternatively, missing this vital information entirely and subsequently dropping into a trail well outside their skill level and potentially causing serious harm to themselves or other trail users.

Signage should clearly define whether a trail is single direction (e.g., climbing only) or dual direction. The latter type of trail should only be implemented if safe to do so, i.e., adequate trail width and clear line of sight.

#### 8.4.2.5 High Quality Trail Design & Construction

All of the above-mentioned considerations can be suitably managed by an experienced and qualified trail professional. It is often more difficult to retrofit many of these key considerations once a trail has been built. On the contrary, if these trail attributes are instilled from the start from concept through to construction, the trail will naturally perform more efficiently and consistently as a whole.

#### 8.4.2.6 Evacuation Points

Suitable extraction and access routes and locations must be established prior to facility opening. This will include aerial extraction points for helicopter retrieval and potential landing.

*Dirt Art* suggests engaging with emergency services during this planning process, to ensure these agencies are comfortable with the proposed methodologies and access points.

#### 8.4.2.7 Evacuation Procedures

Attending to and/or evacuating an injured rider is a rare but necessary requirement at any busy trail network. *Dirt Art* suggest that a detailed emergency management plan be developed prior to the opening of the trail network. This plan should detail methodologies of attending and evacuating riders at a number of strategic locations throughout the network.

### 8.4.3 Management Considerations

#### 8.4.3.1 Overview

Incidents can be managed through the following key considerations:

- Clearly identify primary trail usage
- Permissible secondary trail usage
- Liaison with emergency services
- Noting of key access routes
- Noting of emergency points on all trails
- Consideration of aerial rescue points

#### 8.4.3.2 Clearly Identify Primary Trail Usage

Trail signage should clearly demarcate the intended trail usage to ensure there is no user conflict or misunderstandings between the various user groups. The primary trail use should be defined on all trail signage and maps. Mountain bike (only) trails should be clearly stated and signposted as such, while shared use trails for bikers and walkers/runners should be defined with appropriate signage. The latter category of trail is generally limited to trails

that have been designed for dual-use purposes with clear line of sight throughout the trail alignment and typically a climbing trail for riders. The ascending nature of the trail is important in this case as it naturally limits the overall speed of those on bicycles and resultingly reduces the potential for user conflict. Shared use trails should generally be limited to White Circle or Green Circle trails due to the adequate nominal trail width specified in IMBA's guidelines for these two grades of trail. Notwithstanding, a user's responsibility and code of conduct is vital at each trailhead and associated signage to reinforce user groups to adhere to a mutual respect for one another.

#### *8.4.3.3 Permissible Secondary Trail Usage*

For secondary trail users, such as running or walking, these may deem permissible and safe to be undertaken on certain mountain bike trails. These would normally be limited to White Circle or Green Circle trails. It is not recommended that gravity-orientated descending trails be utilised for shared use with walkers/runners due to the high-speed nature of these trails and technical features within the trails themselves. The trails in these categories may have challenging terrain or features that are already difficult for a rider to negotiate let alone trying to avoid other user groups.

For trails that are well suited to a secondary trail user group, it is important for individuals to understand and respect the needs of each group and recognise the secondary nature of their activity in relation to the riders on the trail. This will enable harmonious trail use and help promote a positive relationship between the different user groups. For example, although a trail maybe designed and marked specifically as a mountain bike trail, trail runners often like to utilise the same network of singletrack trails and benefit greatly from doing so. However, this only works if both user groups respect one another and acknowledge a certain degree of a rider's 'right of way' on the specific trail. From a runner's perspective, this would entail being aware of their surroundings (i.e., not listening to music with earbuds in) and stepping aside off the main trail tread momentarily when a rider approaches from behind, allowing them to pass safely and uninhibited. From a rider's viewpoint, if they see a runner ahead on the trail, they should politely notify the runner and ask to pass them when it is safe for the runner to do so. A simple 'thank you' as a rider passes goes a long way in encouraging and fostering a positive relationship between the user groups.

#### *8.4.3.4 Liaison with Emergency Services*

During any new trail development or formalisation of an existing trail network, it is important to liaise with local emergency service providers such as the Police, Ambulance, and Fire and Rescue to seek their advice and guidance as to what information would be useful for them to have on hand regarding the trails and the proposed user groups. As a land manager, it is important to understand how to best assist emergency services in the case of an incident or emergency – e.g., bushfire event. Having an emergency action plan is particularly pertinent given the scale and type of environment (bushland) that mountain bike trails usually exist within.

#### *8.4.3.5 Noting of Key Access Routes*

Any trail signage should note key access routes such as nearby roads, tracks, and pathways. Key landmarks are often helpful to individuals trying to locate their whereabouts in a given landscape or trail network.

#### *8.4.3.6 Noting of Emergency Points on All Trails*

Emergency access or evacuation points should be formally documented and kept with a nominated person(s) by the land manager. This information should be readily available in the case of an emergency onsite. All trail maps should show the relevant emergency points and necessary contact information. Trail signage can also convey more useful information such as GPS coordinates or directions to the closest access road/track.

#### *8.4.3.7 Consideration of Aerial Rescue Points*

Due the remote bushland or wilderness environment that most mountain bike trails are situated within, aerial means of rescue is often the quickest and most efficient method of extracting an injured person. These extraction points can be identified early on in the trail development or formalisation process by liaising with local emergency providers.

## 10 Conclusion

### 10.1 Overview

The Mount Canobolas Mountain Bike Project represents an incredible opportunity to revitalise the mountain and draw much needed attention and economic funding to the fire-affected area. Mountain biking is a popular recreational activity that has proven itself as being a positive driver for adventure tourism with significant potential to increase visitation to local businesses.

From the outset, the project has acknowledged the area's ecological sensitivities and cultural heritage values. As a result, no trail design works were undertaken until a detailed constraints analysis had been undertaken and completed by the expert teams from *The Environmental Factor* and *Apex Archaeology*. As such, the process of trail design was solely governed by the pockets of land unaffected by high constraints or 'no go areas' as classified within the context of the site. *Dirt Art's* role was to find a viable and sustainable trail network amongst the fragmented pieces of the site deemed to have lower constraints.

### 10.2 Constraints Analysis

A large component of the trail design was undertaken as an intensive desktop exercise with multiple iterations of the design being formed through a process of rigorous interrogation and ongoing refinement as new layers of constraints were discovered and added to the multi-faceted geographic information system (GIS) model. As additional constraints were supplied to *Dirt Art*, the proposed trail network was adjusted accordingly and at times, sections redesigned completely to avoid the identified hotspots of ecological or cultural heritage sensitivities. The iterative process has resulted in a carefully considered, sympathetic, and highly appealing trail network to a wide demographic of riders.

### 10.3 Ground-Truthing

The ground-truthing exercise involved walking and flagging each of the respective trail concept alignments using high-visibility survey tape to mark the corridor at regular intervals. The fieldwork was undertaken over the course of three separate trips in 2021 occurring between 15-18 March, 30 March – 1 April, and 26-28 April. The purpose of the exercise was to establish the constructability of the proposed trail concepts and confirm a corridor to which future trails could be detailed, designed and further assessed. The proposed trail corridors do not represent the final alignments or trails to be constructed as the detailed design of such fall outside the current scope of works and will be undertaken in the next stage of the project.

## 10.4 Blackberry Infestation

The heavy infestation of blackberry weeds made progress in the field particularly slow going with the thickets amongst the worst our teams have encountered to date. At times, the team were required to delve into head-high walls of blackberry in order to establish a viable route through the thorn-laden tangles. Our time in the field really opened our eyes to the poor condition that large portions of the SCA are in post bushfires and highlighted the need for significant and wide-spread maintenance tasks to be implemented in association with adequate funding to do so. The majority of these sites are inaccessible with no existing trails in or within the vicinity. Thus, they would not necessarily be on the radar of the land manager given the lack of active use in these areas – i.e., no public access. Areas of high traffic such as on the verges of roads or existing walking tracks were noted to have been recently sprayed with herbicide.

## 10.5 Trails

A total of 104.4km of mountain bike trails have been proposed in the study area with the majority of the trails, 71.1km (68%), within the SCA, 27km (26%) in Glenwood State Forest, and the remaining 6.3km (6%) in Cabonne Shire Council land. What attracts visitors to the area currently is the summit of Mount Canobolas and the many natural wonders that exist within the SCA. For mountain bikers, they are no different to walkers or sightseers; they want to immerse themselves in the natural beauty found within the landscape. They just choose to travel through the scenery in a different medium, on bicycle as opposed to foot, to enable them to cover more distance while exerting themselves physically, mentally, and socially in a way that is incredibly rewarding and addictive. For this reason, there is a large proportion of trails naturally sited within the SCA to allow this appreciation of the natural environment to occur. By avoiding all areas of high sensitivity within the SCA, Dirt Art have worked incredibly hard to create a functional network that offers a multitude of riding experiences that cater for a broad range of riding difficulties, styles, and abilities.

## 10.6 Trail Difficulty Summary

The proposed trail network is designed to cater for all levels of riders with the bulk of the trails orientated around the beginner (32%) to intermediate (39%) market. The higher concentration of trails in the Blue Square (intermediate) level of difficulty is reflective of the concept's aim to providing a gateway for riders to progress naturally to the more challenging trails. In addition to this, it serves the dual purpose of enticing the enthusiast mountain biker, who is often more compelled to travel further afield to experience new riding destinations and subsequently have a positive contribution to the local economy as a direct result.

DIFFICULTY (IMBA TDRS)	Green Circle (Beginner)	Blue Square (Intermediate)	Black Diamond (Advanced)	Double Black Diamond (Expert)
LENGTH (KM)	33.3	40.7	22.7	7.8
% OF TRAILS	32%	39%	22%	7%

For areas of the site where there is unique terrain suited to providing highly desirable descending opportunities, there will be clusters of descents to cater for a variety of rider abilities ranging from beginner to expert. This is to ensure a broad demographic of riders can enjoy the trail network irrespective of their skill or experience. For more sensitive areas of the site such as the summit, where there is limited space for trails due to ecological and cultural heritage constraints, the default trail difficulty provided is at the lower (beginner) end of the spectrum to ensure less experienced riders are not unnecessarily ruled out from enjoying relating the trail network.

## 10.7 Gravity Focus

The natural highpoint of the site, the summit of Mount Canobolas, offers the most elevational gain or loss across the study area. For this reason, along with its accessibility with established roads (sealed and unsealed), the summit becomes a natural point from which riders are dropped off via a shuttle to make their way back down the mountain via a network of carefully orchestrated trails that cater for the outright beginner through to the most advanced and experienced enthusiast. The proposed trail network focuses on a primarily gravity focused trail product that allows a much broader audience to enjoy the predominately descending riding experience without the deficit of exerting large amounts of energy climbing (riding) to the top, which often precludes many individuals from the activity due to a certain prerequisite level of fitness. A gravity-based network provides a more inclusive offering by utilising uplift services such as private or commercial vehicles to transport riders and their bikes to the top, much like a ski slope and chairlift analogy, in order to ride back down again on their choice of trail. The easily repeatable model is one that has proven to be the most successful and popular at modern mountain bike destinations. The concept plan proposes to utilise two shuttle routes to service the summit from two lower hubs: Tea House Trailhead and Glenwood Trailhead.

## 10.8 Trail Style Summary

The project area lends itself well to a gravity-focused trail network with good elevational opportunities that suit the longer descending trails that most riders seek and a network of established roads that complement a shuttle-based uplift system. As a result, there is a greater spread (66%) of trails orientated towards being a gravity trail product to capitalise on the major attribute that makes the Mount Canobolas project site so ideal. There is a relatively even mix of cross-country and all-mountain style trails to ensure a diversity in

riding options is provided to suit a widespread of rider preferences, especially for those who enjoy the physical challenge and exertion that is associated with these trail typologies.

STYLE	Cross-Country	Link / Climb	All-Mountain	Gravity
LENGTH (KM)	19.7	2.0	19.8	63.0
% OF TRAILS	21%	2%	21%	66%

The trail network can be split into five distinct zones:

- Summit Zone
- Eastern Zone
- South-Western Zone
- Western Trail Zone
- North-Western Zone

These five zones offer a range of trail styles and typologies to appeal to a wide range of riders and make the most of the available terrain and natural features found within the site. They provide a natural canvas for trails to display the unique and inherent qualities of the landscape, a smorgasbord of the different types of vegetation, topographic features, and vistas that make the various aspects of the site spectacular. For this reason, the concept plan aims to capture these natural attributes of the site to form an authentic trail product that exemplifies the qualities found within the land as opposed to trying to recreate or force upon a trail style that is popular elsewhere.

## 10.9 Conclusion

The proposed trail concept plan for Mount Canobolas has the potential to be a nationally significant mountain bike destination to draw a rapidly growing sector in the tourism market to Orange and its surrounds. The proposed development adds to the existing list of reasons to visit the area with food, wine, and cultural experiences being entirely synonymous to the wants and needs of the visiting mountain biker.

The various trail concepts weave their way through a beautiful and stunning landscape, taking riders of all abilities on an experiential journey that encapsulates the many natural wonders of the site. The proposal aims to highlight the site's many diverse attributes to create a unique riding identity for the region that stands apart from its market competitors as opposed to merely trying to mimic another destination.

The project has vast potential to generate significant interest and visitation to the region, boosting the profile of Mount Canobolas and consequently helping to secure much needed funding down to better manage and upgrade degraded parts of the State Conservation Area. In addition to this, the proposed network complements the modest trail offerings already in Forestry land and actively seeks to meld the two together in a meaningful and cohesive way. The trails proposed in the SCA are a means of maximising the elevational

opportunity on offer while also extending the descending experience through to Glenwood Forest where a bike park style of trail is implemented in the more disturbed landscape. The project delivers in its underlying notion of creating a highly sympathetic and sustainable trail network that avoids, mitigates, and offsets any potential impact to the ecological and cultural heritage values of the study area.

## 11 Appendix 1- Proposed Development Budget

# MT CANOBOLAS TRAILS MASTER PLAN

## Appendix 1 - Proposed Development Budget

25-Jun-21

### Development Budget

Existing Trail Upgrades					
ID	Difficulty	Style	Length (km)	Rate (ex. GST)	Cost (ex. GST)
C36	Double Black Diamond	Gravity	1130	\$ 15.00	\$ 16,950.00
			1130.0	<b>Subtotal =</b>	<b>\$ 16,950.00</b>

New Trails					
ID	Difficulty	Style	Length (m)	Rate (ex. GST)	Cost (ex. GST)
C1	Green Circle	XC	3432	\$ 65.00	\$ 223,080.00
C2	Blue Square	XC	2563	\$ 50.00	\$ 128,150.00
C3	Green Circle	XC	2801	\$ 50.00	\$ 140,030.00
C4	Blue Square	XC	3753	\$ 50.00	\$ 187,660.00
C5	Blue Square	XC	1621	\$ 50.00	\$ 81,070.00
C6	Green Circle	XC	2180	\$ 65.00	\$ 141,713.00
C7	Blue Square	XC	3329	\$ 50.00	\$ 166,430.00
C8	Blue Square	Gravity	2048	\$ 65.00	\$ 133,133.00
C9	Black Diamond	Gravity	1645	\$ 65.00	\$ 106,892.50
C10	Blue Square	Gravity	1313	\$ 50.00	\$ 65,670.00
C11	Green Circle	Gravity	4249	\$ 65.00	\$ 276,204.50
C12	Green Circle	Gravity	2943	\$ 65.00	\$ 191,262.50
C13	Green Circle	Gravity	1780	\$ 65.00	\$ 115,687.00
C14	Blue Square	All-Mountain	3721	\$ 50.00	\$ 186,065.00
C15	Blue Square	All-Mountain	3117	\$ 50.00	\$ 155,870.00
C16	Blue Square	All-Mountain	4678	\$ 50.00	\$ 233,915.00
C17	Black Diamond	All-Mountain	6362	\$ 65.00	\$ 413,556.00
C18	Black Diamond	All-Mountain	1871	\$ 65.00	\$ 121,621.50
C19	Double Black Diamond	Gravity	949	\$ 65.00	\$ 61,704.50
C20	Black Diamond	Gravity	1991	\$ 65.00	\$ 129,415.00
C21	Double Black Diamond	Gravity	3004	\$ 65.00	\$ 195,266.50
C22	Blue Square	Gravity	3757	\$ 50.00	\$ 187,825.00
C23	Blue Square	Gravity	3590	\$ 65.00	\$ 233,376.00
C24	Green Circle	Link	1229	\$ 65.00	\$ 79,865.50
C25	Black Diamond	Gravity	1736	\$ 65.00	\$ 112,827.00
C26	Black Diamond	Gravity	3108	\$ 50.00	\$ 155,375.00
C27	Green Circle	Gravity	5636	\$ 65.00	\$ 366,366.00
C28	Green Circle	Gravity	3453	\$ 50.00	\$ 172,645.00
C29	Green Circle	Link	730	\$ 65.00	\$ 47,476.00
C30	Blue Square	Gravity	4450	\$ 75.00	\$ 333,712.50
C31	Double Black Diamond	Gravity	2699	\$ 85.00	\$ 229,449.00
C32	Black Diamond	Gravity	3313	\$ 95.00	\$ 314,754.00
C33	Black Diamond	Gravity	2649	\$ 85.00	\$ 225,148.00
C34	Blue Square	Gravity	2734	\$ 75.00	\$ 205,012.50
C35	Green Circle	Gravity	4831	\$ 65.00	\$ 314,028.00
			103265.8	<b>Subtotal =</b>	<b>\$ 6,432,255.50</b>

New Trails Related Infrastructure		
Item / Description	Rate (ex. GST)	Cost (ex. GST)
Asphalt Pump Track	\$ 500,000.00	\$ 500,000.00
Trail Signage	\$ 165,000.00	\$ 165,000.00
		<b>Subtotal = \$ 665,000.00</b>

### Summary of Costs

Development Budget	
Item / Description	Cost (ex. GST)
Existing Trail Upgrades	\$ 16,950.00
New Trails	\$ 6,432,255.50
Related Infrastructure	\$ 665,000.00
<b>Total = \$ 7,114,205.50</b>	

### Rates

Difficulty (IMBA)	Style	Cost (ex. GST)
Green Circle	Cross-Country	\$ 65.00
Blue Square	Cross-Country / All-Mountain	\$ 50.00
Black Diamond	Technical / All-Mountain	\$ 65.00
Double Black Diamond	Technical / All-Mountain	\$ 65.00
Green Circle	Flow	\$ 65.00
Blue Square	Flow / Freeride / Jumps	\$ 75.00
Black Diamond	Freeride / Jumps	\$ 85.00
Double Black Diamond	Freeride / Jumps	\$ 95.00

## 12 Appendix 2- Proposed Development Stage Plan

# MT CANOBOLAS TRAILS MASTER PLAN

## Appendix 2 - Proposed Development Staging Plan

15-Jul-21

### Development Budget - Staging Plan

Existing Trail Upgrades						
ID	Difficulty	Style	Length (km)	Rate (ex. GST)	Cost (ex. GST)	Development Stage
C36	Double Black Diamond	Gravity	1130	\$ 15.00	\$ 16,950.00	Stage 2
			1130.0	<b>Subtotal =</b>	<b>\$ 16,950.00</b>	






New Trails						
ID	Difficulty	Style	Length (m)	Rate (ex. GST)	Cost (ex. GST)	Development Stage
C1	Green Circle	XC	3432	\$ 65.00	\$ 223,080.00	Stage 1
C2	Blue Square	XC	2563	\$ 50.00	\$ 128,150.00	Stage 1
C3	Green Circle	XC	2801	\$ 50.00	\$ 140,030.00	Stage 1
C4	Blue Square	XC	3753	\$ 50.00	\$ 187,660.00	Stage 1
C5	Blue Square	XC	1621	\$ 50.00	\$ 81,070.00	Stage 1
C6	Green Circle	XC	2180	\$ 65.00	\$ 141,713.00	Stage 1
C7	Blue Square	XC	3329	\$ 50.00	\$ 166,430.00	Stage 1
C8	Blue Square	Gravity	2048	\$ 65.00	\$ 133,133.00	Stage 1
C9	Black Diamond	Gravity	1645	\$ 65.00	\$ 106,892.50	Stage 1
C10	Blue Square	Gravity	1313	\$ 50.00	\$ 65,670.00	Stage 1
C11	Green Circle	Gravity	4249	\$ 65.00	\$ 276,204.50	Stage 1
C12	Green Circle	Gravity	2943	\$ 65.00	\$ 191,262.50	Stage 1
C13	Green Circle	Gravity	1780	\$ 65.00	\$ 115,687.00	Stage 2
C14	Blue Square	All-Mountain	3721	\$ 50.00	\$ 186,065.00	Stage 2
C15	Blue Square	All-Mountain	3117	\$ 50.00	\$ 155,870.00	Stage 2
C16	Blue Square	All-Mountain	4678	\$ 50.00	\$ 233,915.00	Stage 2
C17	Black Diamond	All-Mountain	6362	\$ 65.00	\$ 413,556.00	Stage 2
C18	Black Diamond	All-Mountain	1871	\$ 65.00	\$ 121,621.50	Stage 2
C19	Double Black Diamond	Gravity	949	\$ 65.00	\$ 61,704.50	Stage 2
C20	Black Diamond	Gravity	1991	\$ 65.00	\$ 129,415.00	Stage 2
C21	Double Black Diamond	Gravity	3004	\$ 65.00	\$ 195,266.50	Stage 2
C22	Blue Square	Gravity	3757	\$ 50.00	\$ 187,825.00	Stage 2
C23	Blue Square	Gravity	3590	\$ 65.00	\$ 233,376.00	Stage 2
C24	Green Circle	Link	1229	\$ 65.00	\$ 79,865.50	Stage 2
C25	Black Diamond	Gravity	1736	\$ 65.00	\$ 112,827.00	Stage 2
C26	Black Diamond	Gravity	3108	\$ 50.00	\$ 155,375.00	Stage 2
C27	Green Circle	Gravity	5636	\$ 65.00	\$ 366,366.00	Stage 1
C28	Green Circle	Gravity	3453	\$ 50.00	\$ 172,645.00	Stage 2
C29	Green Circle	Link	730	\$ 65.00	\$ 47,476.00	Stage 1
C30	Blue Square	Gravity	4450	\$ 75.00	\$ 333,712.50	Stage 1
C31	Double Black Diamond	Gravity	2699	\$ 85.00	\$ 229,449.00	Stage 1
C32	Black Diamond	Gravity	3313	\$ 95.00	\$ 314,754.00	Stage 1
C33	Black Diamond	Gravity	2649	\$ 85.00	\$ 225,148.00	Stage 1
C34	Blue Square	Gravity	2734	\$ 75.00	\$ 205,012.50	Stage 1
C35	Green Circle	Gravity	4831	\$ 65.00	\$ 314,028.00	Stage 1
			103265.8	<b>Subtotal =</b>	<b>\$ 6,432,255.50</b>	

New Trails Related Infrastructure			
Item / Description	Rate (ex. GST)	Cost (ex. GST)	Development Stage
Asphalt Pump Track	\$ 500,000.00	\$ 500,000.00	Stage 1
Trail Signage	\$ 165,000.00	\$ 165,000.00	Stage 1 & 2
		<b>Subtotal =</b>	<b>\$ 665,000.00</b>

### Summary of Costs

Development Budget	
Development Stage	Cost (ex. GST)
Stage 1 (62% Trail Signage; Trails: C1-C12, C27, C29-C35)	\$ 3,979,541.50
Stage 2 (28% Trail Signage; Asphalt Pump Track; Trails: C13-C26, C28, C36)	\$ 3,134,664.00
<b>Total (ex. GST) =</b>	<b>\$ 7,114,205.50</b>

## 13 Appendix 3- IMBA TDRS

IMBA Trail Difficulty Rating System					
					
	EASIEST WHITE CIRCLE	EASY GREEN CIRCLE	MORE DIFFICULT BLUE SQUARE	VERY DIFFICULT BLACK DIAMOND	EXTREMELY DIFFICULT DBL. BLACK DIAMOND
TRAIL WIDTH	72" (1,800 mm) or more	36" (900 mm) or more	24" (600 mm) or more	12" (300 mm) or more	6" (150 mm) or more
TREAD SURFACE	Hardened or surfaced	Firm and stable	Mostly stable with some variability	Widely variable	Widely variable and unpredictable
AVERAGE TRAIL GRADE	Less than 5%	5% or less	10% or less	15% or less	20% or more
MAXIMUM TRAIL GRADE	Max 10%	Max 15%	Max 15% or greater	Max 15% or greater	Max 15% or greater
NATURAL OBSTACLES AND TECHNICAL TRAIL FEATURES (TTF)	None	Unavoidable obstacles 2" (50 mm) tall or less  Avoidable obstacles may be present  Unavoidable bridges 36" (900 mm) or wider	Unavoidable obstacles 8" (200 mm) tall or less  Avoidable obstacles may be present  Unavoidable bridges 24" (600 mm) or wider  TTF's 24" (600 mm) high or less, width of deck is greater than 1/2 the height	Unavoidable obstacles 15" (380 mm) tall or less  Avoidable obstacles may be present  May include loose rocks  Unavoidable bridges 24" (600 mm) or wider  TTF's 48" (1,200 mm) high or less, width of deck is less than 1/2 the height  Short sections may exceed criteria	Unavoidable obstacles 15" (380 mm) tall or less  Avoidable obstacles may be present  May include loose rocks  Unavoidable bridges 24" (600 mm) or narrower  TTF's 48" (1,200 mm) high or greater, width of deck is unpredictable  Many sections may exceed criteria